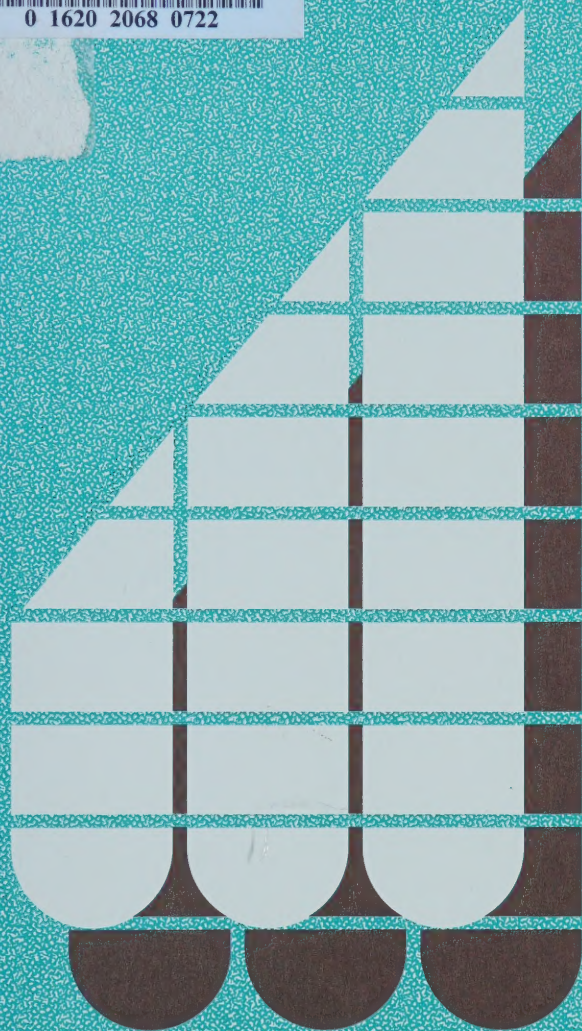


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Michigan State University
Agricultural Experiment Station



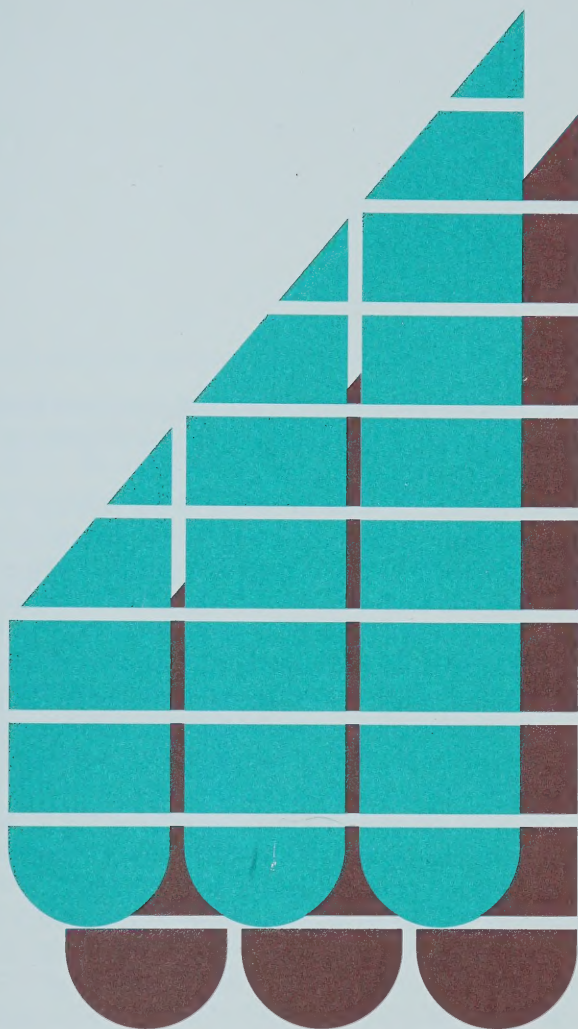
1993 Annual Report

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Michigan State University Agricultural Experiment Station



1993 Annual Report

109 Agriculture Hall
Michigan State University
East Lansing, MI 48824-1039
(517)355-0123

Report prepared under the direction of Robert G. Gast, director of the Michigan Agricultural Experiment Station, and Doreen Woodward, assistant director finance & operations.

Design by Christine Altese; editing and production by Jamie DePolo, information officer, Outreach Communications.



1993:

Advancing Agricultural and Natural Resources Research

The Michigan Agricultural Experiment Station at MSU made significant advances in 1993 despite a tightening economy and budget constraints.

The research program of the Status and Potential of Michigan Agriculture (SAPMA) project began this year. For this project, researchers prepared background papers, analyzing data from U.S. Census reports, MAES surveys of Michigan agriculture, Michigan Department of Agriculture Futures Team 2020 base papers and other sources. Using these papers and other information, teams of MSU faculty members assessed the current status of 22 Michigan agricultural commodities or farming enterprises and developed estimates of potential growth.

Once the agricultural growth potential and its constraints were agreed on, the MAES issued a call for research preproposals to address these issues and problems. The MAES received 53 preproposals; from these, 14 were selected to be developed into full proposals, and ultimately nine projects were funded for three years for a total of \$1.3 million. The projects cover topics identified as priority areas by the SAPMA projects, including health problems in dairy cows, exporting Michigan agribusiness and food products, agricultural deer damage in the state, marketing Michigan fruit, improving Christmas tree production and rural poverty issues in Michigan.

Following in the footsteps of the SAPMA project, the Status and Potential of Michigan Natural Resources (SAPMINR) project was initiated and will look at all aspects of Michigan's natural resources, taking inventory of relevant research, identifying trends and future opportunities, and appraising the potential for growth.

Coordinated by Vincent Bralts, an agricultural engineering scientist and former MAES leadership intern, the project will produce four overview reports and 10 reports focused on specific natural resources and industries. Drafts of the reports will be discussed during ANR Week at MSU in March. Like the SAPMA reports, the SAPMINR reports will be the basis for an interdisciplinary research call for proposals.

The 1993-94 participants in the MAES leadership intern program are Frank D'Itri, professor of fisheries and wildlife and associate director of the Institute of Water Research,

and Jim Render, associate professor of pathology and associate professor in the Animal Health Diagnostic Laboratory. Sponsored by the national Experiment Station Committee on Organization and Policy (ESCOP) and the Cooperative State Research Service (CSRS), the program was created in recognition of the need to develop future leadership for the agricultural experiment station system.

In other personnel matters, Waldo Keller was named acting dean of the College of Veterinary Medicine, William Spielman was appointed chairperson of the Department of Physiology and Kenneth Keegstra was selected as director of the MSU/Department of Energy Plant Research Lab. Bruce Harte was installed as director of the School of Packaging and Sandra Batie was chosen for the Elton Smith Endowed Chair in Agricultural Economics.

The governor and the Michigan Legislature approved \$69.9 million in funding for facilities for the Michigan Animal Agriculture Initiative. The money will fund the renovation of Anthony Hall, a new or renovated dairy plant and meats lab, a new Agriculture and Livestock Education Center, and the renovation of field facilities south of Mt. Hope Road for dairy, swine, beef, equine and some poultry research. Architects have been hired for the project and construction will begin in late summer or fall 1994.

In more facility news, the legislature appropriated and the governor approved \$3.1 million for a crop and soil sciences field laboratory at the corner of Mt. Hope and Beaumont roads. Architects have been hired and construction will probably begin in summer 1994.

1994, like each new year, will bring a fresh set of challenges and opportunities. By helping agriculture and natural resources identify their strengths and constraints to growth, the Michigan Agricultural Experiment Station is ready to assist them to be competitive and thrive in the next century.



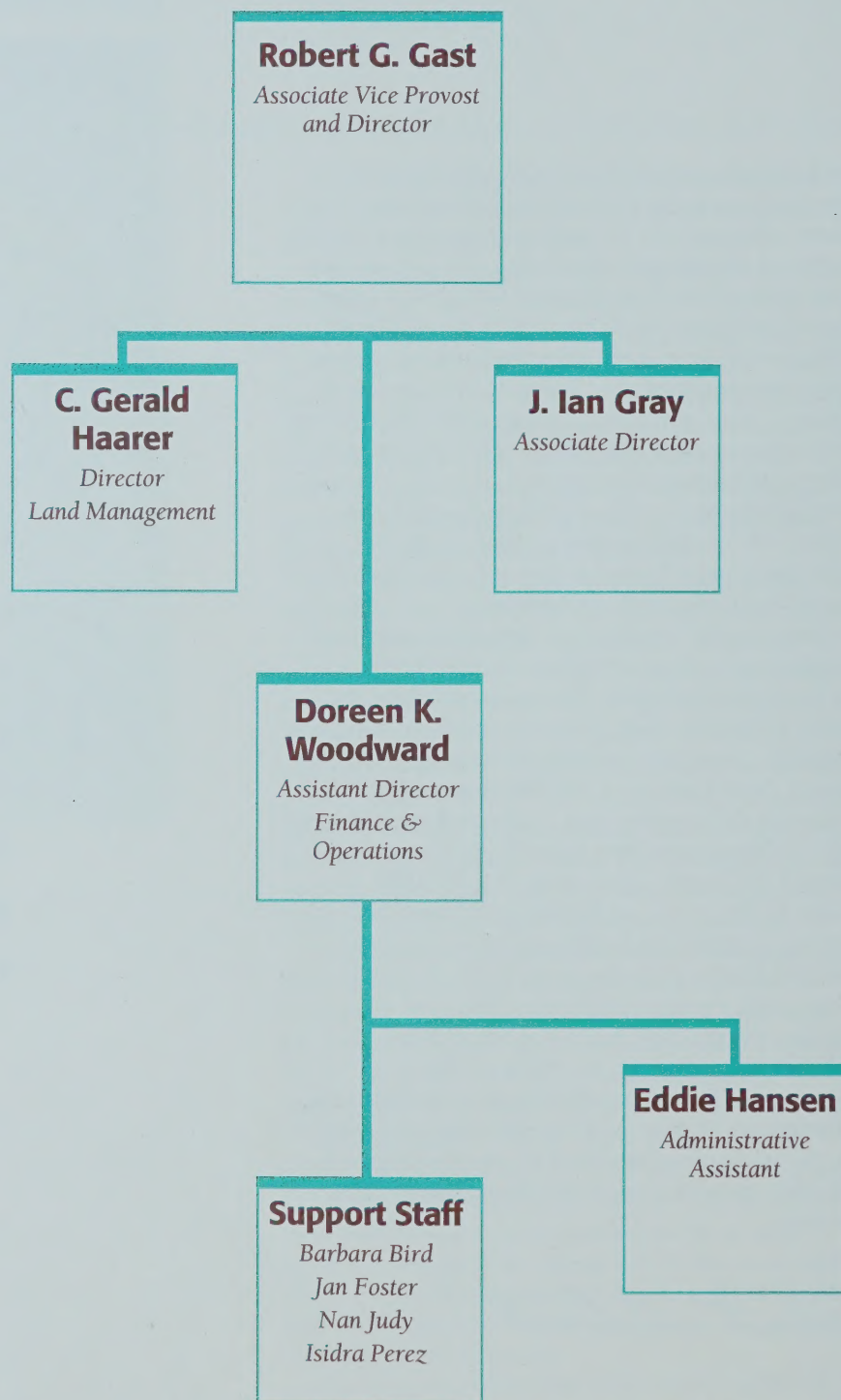
Robert G. Gast
Director
Michigan Agricultural Experiment Station



"The MAES received 53 preproposals; from these, 14 were selected to be developed into full proposals, and ultimately nine projects were funded for three years for a total of \$1.3 million."

Michigan Agricultural Experiment Station

Organizational Flow Chart As of 10-1-93



DEANS

Fred L. Poston
Vice Provost and Dean
College of Agriculture and Natural Resources
(517) 355-0233

Julia Miller
Dean, College of Human Ecology
(517) 355-7714

Frank Hoppensteadt
Dean, College of Natural Science
(517) 355-4473

Kenneth Corey
Dean, College of Social Science
(517) 355-6675

Waldo Keller
Acting Dean, College of Veterinary Medicine
(517) 355-6509

MAES Affiliated Deans and Unit Administrators

As of 10-1-93

UNIT ADMINISTRATORS

Carroll Wamhoff
Chairperson, Agricultural & Extension
Education
(517) 355-6580

Larry G. Hamm
Chairperson, Agricultural Economics
(517) 355-4567

Robert D. von Bernuth
Chairperson, Agricultural Engineering
(517) 353-7268

Maynard Hogberg
Chairperson, Animal Science
(517) 355-8384

John Wilson
Chairperson, Biochemistry
(517) 353-0804

Gustaaf de Zoeten
Chairperson, Botany & Plant Pathology
(517) 355-4688

Eldor Paul
Chairperson, Crop & Soil Sciences
(517) 355-0262

Mark Scriber
Chairperson, Entomology
(517) 355-4665

Lawrence J. Fischer
Director, Institute for Environmental
Toxicology
(517) 353-6469

Robert Griffore
Chairperson, Family & Child Ecology
(517) 355-7680

William Taylor
Chairperson, Fisheries & Wildlife
(517) 353-0647

P. Vincent Hegarty
Chairperson, Food Science & Human
Nutrition
(517) 355-8476

Daniel Keathley
Chairperson, Forestry
(517) 355-0093

Judy Olson
Chairperson, Geography
(517) 355-4649

Wayne Loescher
Chairperson, Horticulture
(517) 355-5191

Timothy Springer
Chairperson, Human Environment & Design
(517) 355-7712

Michael Klug
Acting Director, Kellogg Biological Station
(616) 671-5117

C. Gerald Haarer
Director, Land Management
(517) 355-3272

Frederik Derksen
Chairperson, Large Animal Clinical Sciences
(517) 355-0593

Jerry Dodgson
Chairperson, Microbiology
(517) 355-6465

Maxine S. Ferris
Manager, Outreach Communications
(517) 336-1555

Bruce Harte
Director, School of Packaging
(517) 353-6462

Betty van der Smissen
Chairperson, Park & Recreation Resources
(517) 353-0822

Charles Mackenzie
Chairperson, Pathology
(517) 353-9160

Robert Hollingworth
Director, Pesticide Research Center
(517) 353-9430

William Spielman
Chairperson, Physiology
(517) 355-4488

Kenneth Keegstra
Director, MSU-DOE Plant Research Lab
(517) 353-2270

Jon Bartholic
Coordinator, Center for Remote Sensing
Director, Institute of Water Research
(517) 355-3421

Frank Fear
Chairperson, Resource Development
(517) 355-3421

Chris Vanderpool
Chairperson, Sociology (517) 355-6632

Michigan Agricultural Experiment Station

Outlying Stations

10-1-93

1. East Lansing Field Research Facilities

Established 1888

109 Agriculture Hall
East Lansing, MI 48824-1039
Phone: (517) 355-3272
C. Gerald Haarer
Director, Land Management

2. Clarksville Horticultural Experiment Station

Established 1974

Box 77A
9302 Portland Road
Clarksville, MI 48815
Phone: (616) 693-2193
Gerald Skeltis
Farm Manager

3. Dunbar Forest Experiment Station

Established 1925

Rt. 1, Box 179
Sault Ste. Marie, MI 49783
Phone: (906) 786-1575
Ray Miller
Forester

4. W.K. Kellogg Biological Station and W.K. Kellogg Forest

Established 1928

3700 E. Gull Lake Drive
Hickory Corners, MI 49060
Phone: (616) 671-5117
Bernie Knezek (616) 671-2324
Director, Agricultural Programs
Mike Klug (616) 671-2323
Acting Director, Programs and Development
Greg Kowalewski (616) 731-4597
Resident Forester

5. Lake City Experiment Station

Established 1928

5401 W. Jennings Road
Lake City, MI 49651
Phone: (616) 839-4608
Doug Nielsen
Farm Manager

6. Montcalm Experimental Farm

Established 1966

4747 McBride
Lakeview, MI 48850
Phone: (517) 365-3473
Richard Crawford
Technician

7. Muck Soils Research Farm

Established 1941

Rt. 3
9422 E. Herbison Road
Laingsburg, MI 48848
Phone: (517) 641-4062
Ronald Gnagey
Farm Manager

8. Northwest Michigan Horticultural Research Station

Established 1979

6686 S. Center Highway
Traverse City, MI 49684
Phone: (616) 946-1510
James Nugent
Coordinator
Bill Klein
Farm Manager

9. Fred Russ Forest Experiment Station

Established 1942

20673 Marcellus Highway
Decatur, MI 49045
Phone: (616) 782-5652
Greg Kowalewski
Forester

10. Saginaw Valley Beet and Bean Research Farm

Established 1971

3066 S. Thomas Road
Saginaw, MI 48603
Phone: (517) 781-1160
Paul Horny
Farm Manager

11. SW Michigan Research & Extension Center

Established 1987

1791 Hillandale Road
Benton Harbor, MI 49022
Phone: (616) 944-1477
James Ertman
Farm Manager
Tom Zabadal
Station Coordinator

12. Trevor Nichols Research Complex

Established 1967

6237 124th Avenue
Fennville, MI 49408
Phone: (616) 561-5040
Matthew Daly
Farm Manager

13. Upper Peninsula Experiment Station

Established 1899

102 University Drive
Chatham, MI 49816
Phone: (906) 439-5114
Paul Naasz
Farm Manager

14. Upper Peninsula Tree Improvement Center

Established 1986

6005 J Road
Escanaba, MI 49829
Phone: (906) 786-1575
Ray Miller
Resident Forester



Alphabetical List of MAES Scientists

As of 10-1-93

Faculty members with dual appointments are listed in both of the departments in which they serve.

NAME	DEPARTMENT
Adams, Gerard C.	Botany & Plant Pathology
Allen, Michael	Animal Science
Allison, Richard	Botany & Plant Pathology
Anderson, James H.	Agricultural Engineering
Anderson, Richard L.	Biochemistry
Anderson, Sharon J.	Crop & Soil Sciences
Aulerich, Richard J.	Animal Science
Axinn, George	Resource Development
Ayers, George S.	Entomology
Baker, John C.	Large Animal Clinical Sciences
Bakker-Arkema, Fred W.	Agricultural Engineering
Balander, Richard J.	Animal Science
Batie, Sandra S.*	Agricultural Economics
Beaudry, Randolph M.	Horticulture
Bell, Thomas G.	Pathology
Bennink, Maurice R.	Human Nutrition
Benson, Margaret	Animal Science
Bergen, Werner G.	Animal Science
Berglund, Kris A.	Agricultural Engineering
Bickert, William G.	Agricultural Engineering
Biernbaum, John A.	Horticulture
Bird, George W.	Entomology
Black, J. Roy	Agricultural Economics
Bokemeier, Janet L.	Sociology
Bond, Jenny T.	Human Nutrition
Bonnen, James T.	Agricultural Economics
Booren, Alden M.	Food Science
Boyd, Stephen A.	Crop & Soil Sciences
Bralts, Vincent F.	Agricultural Engineering
Branham, Bruce E.	Crop & Soil Sciences
Breznak, John A.	Microbiology
Bristow, Catherine	Entomology
Bronstein, Daniel A.	Resource Development
Brook, Roger C.	Agricultural Engineering
Bucholtz, Herbert F.	Animal Science
Bukovac, Martin J.	Horticulture
Burkhardt, Thomas H.	Agricultural Engineering
Bursian, Steven	Animal Science
Burton, Zachary	Biochemistry
Busch, Lawrence M.	Sociology
Bush, Guy L.	Kellogg Biological Station
Cameron, Arthur C.	Horticulture
Campa, Henry III	Fisheries & Wildlife
Carlson, William H.	Horticulture

NAME	DEPARTMENT
Cash, Jerry N.	Food Science
Champness, Wendy C.	Microbiology
Chang, Timothy S.	Animal Science
Chase, Richard W.	Crop & Soil Sciences
Chenoweth, Wanda L.	Human Nutrition
Chou, Karen	Animal Science
Christenson, Donald R.	Crop & Soil Sciences
Coe, Paul H.	Animal Science
Cook, Robert M.	Animal Science
Coon, Thomas G.	Fisheries & Wildlife
Coussens, Paul M.	Animal Science
Crawford, Eric W.	Agricultural Economics
Crum, James L.	Crop & Soil Sciences
Dazzo, Frank B.	Microbiology
de Bruijn, Frans J.	Plant Research Laboratory
de Bruijn, Frans J.	Microbiology
Dennis, Frank G., Jr.	Horticulture
Dersch, Eckhart	Resource Development
Dickmann, Donald I.	Forestry
Diers, Brian	Crop & Soil Sciences
Dilley, David R.	Horticulture
Douches, David S.	Crop & Soil Sciences
Downes, Theron W.	Packaging
Dukelow, W. Richard	Animal Science
Dukelow, W. Richard	Physiology
Edens, Thomas C.	Entomology
Edens, Thomas C.	Resource Development
Eicher, Carl K.	Agricultural Economics
Ellis, Boyd G.	Crop & Soil Sciences
Emery, Roy S.	Animal Science
Erskine, Ronald J.	Large Animal Clinical Sciences
Ewart, Lowell C.	Horticulture
Ferris, John N.	Agricultural Economics
Ferris, Theodore A.	Animal Science
Flegal, Cal J.	Animal Science
Flore, James A.	Horticulture
Fogwell, Ralph L.	Animal Science
Foster, Eunice F.	Crop & Soil Sciences
Fraker, Pamela J.	Biochemistry
Freed, Russell D.	Crop & Soil Sciences
Fridgen, Joseph D.	Park & Recreation Resources
Fried, Jeremy S.	Forestry
Fulbright, Dennis W.	Botany & Plant Pathology
Gage, Stuart H.	Entomology

NAME	DEPARTMENT
Garling, Donald L.	Fisheries & Wildlife
Gerrish, John B.	Agricultural Engineering
Giacin, Jack R.	Packaging
Giesy, John P.	Fisheries & Wildlife
Gill, John L.	Animal Science
Grafius, Edward J.	Entomology
Graham-Tomasi, Theodore	Agricultural Economics
Graham, Richard L.	Human Environment & Design
Gray, J. Ian	Food Science
Grimes, Sheila D.	Pathology
Grulke, Eric A.	Agricultural Engineering
Grumet, Rebecca	Horticulture
Guyer, Daniel E.	Agricultural Engineering
Hammerschmidt, Raymond	Botany & Plant Pathology
Hancock, James F.	Horticulture
Hanson, Eric J.	Horticulture
Hanson, Steven D.	Agricultural Economics
Harpstead, Dale D.	Crop & Soil Sciences
Harris, Craig K.	Sociology
Harsh, Stephen B.	Agricultural Economics
Hart, James B., Jr.	Forestry
Hart, John H.	Botany & Plant Pathology
Hart, L. Patrick	Botany & Plant Pathology
Harwood, Richard R.**	Crop & Soil Sciences
Haufler, Jonathan B.	Fisheries & Wildlife
Hausbeck, Mary K.	Botany & Plant Pathology
Hausinger, Robert P.	Microbiology
Hawkins, David R.	Animal Science
Haynes, Dean L.	Entomology
Heins, Royal D.	Horticulture
Heinze, Kirk L.	Ag & Extension Education
Helferich, William G.	Food Science
Herd, Thomas H.	Large Animal Clinical Sciences
Hernandez, Ruben J.	Packaging
Herner, Robert C.	Horticulture
Hesterman, Oran B.	Crop & Soil Sciences
Hill, Gretchen M.	Animal Science
Hoehn, John P.	Agricultural Economics
Hoerr, Sharon M.	Human Nutrition
Holecek, Donald F.	Park & Recreation Resources
Holland, John F.	Biochemistry
Holland, Robert E.	Large Animal Clinical Sciences
Hootman, Seth R.	Physiology
Howell, Gordon S.	Horticulture
Hull, Jerome, Jr.	Horticulture
Iezzoni, Amy F.	Horticulture
Imig, David R.	Family & Child Ecology
Ireland, James J.	Animal Science
Jacobs, Lee W.	Crop & Soil Sciences
Jaros, Andrew	Botany & Plant Pathology
Johnson, James W.	Entomology
Johnson, Nan E.	Sociology
Jones, Alan L.	Botany & Plant Pathology
Kaguni, Jon M.	Biochemistry
Kakela, Peter J.	Resource Development
Kaneene, John B.	Large Animal Clinical Sciences
Keefe, Dennis R.	Family & Child Ecology
Keith, Joanne G.	Family & Child Ecology

NAME	DEPARTMENT
Kells, James J., Jr.	Crop & Soil Sciences
Kelly, James D.	Crop & Soil Sciences
Kelly, John F.	Horticulture
Kevern, Niles R.	Fisheries & Wildlife
Kielbaso, Julian J.	Forestry
Kimball, William J.	Resource Development
Kindel, Paul K.	Biochemistry
Klug, Michael J.	Microbiology
Knezek, Bernard D.	Crop & Soil Sciences
Kroos, Lee	Biochemistry
Kunze, Raymond J.	Crop & Soil Sciences
Lacy, Melvyn L.	Botany & Plant Pathology
Landis, Douglas A.	Entomology
Lantagne, Douglas O.	Forestry
Leefer, Larry A.	Forestry
Leep, Richard H.	Crop & Soil Sciences
Lee, Julian J. L.	Packaging
Lenski, Richard E.***	Crop & Soil Sciences
Levine, S. Joseph	Ag & Extension Education
Linz, John E.	Food Science
Lloyd, James W.	Agricultural Economics
Loudon, Theodore L.	Agricultural Engineering
Maes, Roger K.	Microbiology
Manderscheid, Lester V.	Agricultural Economics
Manthy, Robert S.	Forestry
Mao, Ivan Ling	Animal Science
McCullough, Deborah G.	Entomology
McDonough, Maureen H.	Forestry
McGroarty, Estelle J.	Biochemistry
McNabb, Clarence D.	Fisheries & Wildlife
Merritt, Richard W.	Entomology
Merva, George E.	Agricultural Engineering
Miller, James R.	Entomology
Mokma, Delbert L.	Crop & Soil Sciences
Moline, Waldimar J.	Crop & Soil Sciences
Myers, Robert S.	Agricultural Economics
Nair, Muraleedharan G.	Horticulture
Nelson, Charles M.	Park & Recreation Resources
Ng, Perry K. W.	Food Science
Oehmke, James F.	Agricultural Economics
Ofoli, Robert Y.	Food Science
Ohlrogge, John	Botany & Plant Pathology
Olsen, Larry G.	Pesticide Research Center
Padgett, George A.	Pathology
Partridge, John A.	Food Science
Patterson, Jon S.	Pathology
Penner, Donald	Crop & Soil Sciences
Perry, Ronald L.	Horticulture
Person, Howard L.	Agricultural Engineering
Pestka, James J.	Food Science
Peterson, H. Christopher	Agricultural Economics
Peyton, R. Benny	Fisheries & Wildlife
Pierce, J. Francis	Crop & Soil Sciences
Potter-Witter, Karen L.	Forestry
Pregitzer, Kurt S.	Forestry
Preiss, Jack	Biochemistry
Price, James F.	Food Science
Prince, Harold H.	Fisheries & Wildlife

NAME	DEPARTMENT
Raikhel, Alexander S.	Entomology
Ramm, Carl W.	Forestry
Ramsdell, Donald C.	Botany & Plant Pathology
Reddy, C. Adinarayana	Microbiology
Render, James A.	Pathology
Renner, Karen A.	Crop & Soil Sciences
Ricks, Donald J.	Agricultural Economics
Rieke, Paul E.	Crop & Soil Sciences
Ritchie, Harlan D.	Animal Science
Ritchie, Joe T.****	Crop & Soil Sciences
Robertson, G. Phillip	Crop & Soil Sciences
Robinson, Norman E.	Large Animal Clinical Sciences
Robison, Lindon J.	Agricultural Economics
Rogers, John N. III	Crop & Soil Sciences
Romsos, Dale R.	Human Nutrition
Rozeboom, Dale	Animal Science
Rust, Steven	Animal Science
Safir, Gene R.	Botany & Plant Pathology
Sawyer, Carol A.	Human Nutrition
Schemmel, Rachelle A.	Human Nutrition
Schiamborg, Lawrence R.	Family & Child Ecology
Schindler, Melvin	Biochemistry
Schmidt, Thomas M.	Microbiology
Schmid, A. Allan	Agricultural Economics
Schultink, Gerhardus	Resource Development
Schutzki, Robert E.	Horticulture
Schwab, Gerald D.	Agricultural Economics
Schwarzweiler, Harry K.	Sociology
Schweikhardt, David B.	Agricultural Economics
Sears, Barbara	Botany & Plant Pathology
Segerlind, Larry J.	Agricultural Engineering
Shaffer, James D.	Agricultural Economics
Singh, Sher Paul	Packaging
Sink, Kenneth C.	Horticulture
Skidmore, Andrew	Animal Science
Slocum, Ann C.	Human Environment & Design
Smith, Denise M.	Food Science
Smitley, David R.	Entomology
Smucker, A.J.M.	Crop & Soil Sciences
Somerville, Shauna	Plant Research Laboratory
Song, Won O.	Human Nutrition
Sontag, M. Suzanne	Human Environment & Design
Srivastava, Ajit K.	Agricultural Engineering
Staatz, John S.	Agricultural Economics
Steffe, James F.	Agricultural Engineering
Stehr, Frederick W.	Entomology
Sternquist, Brenda J.	Human Environment & Design
Stevens, James A.	Forestry
Strasburg, Gale M.	Food Science
Stynes, Daniel J.	Park & Recreation Resources
Suchsland, Otto M.	Forestry
Surbrook, Truman C.	Agricultural Engineering
Swinton, Scott M.	Agricultural Economics
Thacker, Brad J.	Large Animal Clinical Sciences
Thiem, Suzanne	Entomology
Thomashow, Michael F.	Crop & Soil Sciences
Thomashow, Michael F.	Microbiology

NAME	DEPARTMENT
Tiedje, James M.	Microbiology
Tiedje, James M.	Crop & Soil Sciences
Triezenberg, Steven	Biochemistry
Tucker, H. Allen	Animal Science
Uebersax, Mark A.	Food Science
Uffen, Robert L.	Microbiology
Ustunol, Zeynep	Food Science
Van Ee, Gary R.	Agricultural Engineering
van Ravenswaay, Eileen O.	Agricultural Economics
VandeHaar, Michael	Animal Science
Vander Stoep, Gail A.	Park & Recreation Resources
Vargas, Joseph M., Jr.	Botany & Plant Pathology
Velicer, Leland F.	Microbiology
Vitosh, Maurice L.	Crop & Soil Sciences
Walker, Edward D.	Entomology
Walker, Rosemary	Family & Child Ecology
Wang, John L.	Biochemistry
Ward, Richard W.	Crop & Soil Sciences
Warncke, Darryl D.	Crop & Soil Sciences
Watson, J. Throck	Biochemistry
Weber, Michael T.	Agricultural Economics
Whalon, Mark E.	Entomology
Whims, Fred	Ag & Extension Education
Widders, Irvin E.	Horticulture
Wilkinson, Robert H.	Agricultural Engineering
Winterstein, Scott R.	Fisheries & Wildlife
Yokoyama, Melvin T.	Animal Science
Yumkella, Kandeh K.	Agricultural Economics
Zabadal, Thomas J.	Horticulture
Zabik, Mary E.	Human Nutrition
Zabik, Matthew J.	Entomology
Zabik, Matthew J.	Pesticide Research Center
Zandstra, Bernard H.	Horticulture
Zile, Maija H.	Human Nutrition
Zipser, Birgit	Physiology

* Elton Smith Endowed Chair

** C.S. Mott Distinguished Professor of Sustainable Agriculture

*** Hannah Professor for Microbial Ecology and Plant Science

**** Nowlin Professor for Water Research

List of MAES Scientists by Department

As of 10-1-93

The names listed here represent the faculty members who have an MAES appointment and are in the tenure stream as of 10-1-93. Faculty members with dual appointments are listed in both of the departments in which they serve.

KEY

MAES = Michigan Agricultural Experiment Station
MSUE = Michigan State University Extension
Joint = Joint Appointment in an MAES affiliated College or Department

12 = Professor
13 = Associate Professor
14 = Assistant Professor



	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Heinze, Kirk L.	13	0.20	0.00	0.00	0.80	Communication
Levine, S. Joseph	12	0.20	0.50	0.00	0.30	Faculty Development
Whims, Fred	12	0.40	0.40	0.00	0.20	Extension Education
TOTALS:		0.80	0.90	0.00	1.30	

Ag & Extension Education

Phone: 355-6580

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Batie, Sandra S.*	12	0.60	0.20	0.00	0.20	Food and Agriculture Policy
Black, J. Roy	12	0.80	0.00	0.00	0.20	Farm Management
Bonnen, James T.	12	0.85	0.00	0.00	0.15	Public Policy
Crawford, Eric W.	12	0.40	0.35	0.00	0.25	International Development
Eicher, Carl K.	12	0.50	0.00	0.00	0.50	International Development
Ferris, John N.	12	0.20	0.65	0.00	0.15	Outlook & Prices
Graham-Tomasi, Theodore	13	0.65	0.00	0.00	0.35	Resource Economics
Hanson, Steven D.	13	0.80	0.00	0.00	0.20	Agricultural Finance
Harsh, Stephen B.	12	0.20	0.65	0.00	0.15	Farm Management
Hoehn, John P.	13	0.70	0.00	0.00	0.30	Resource Development
Lloyd, James W.	14	0.20	0.00	0.00	0.80	Livestock Prod/Health Mgt/ Food Safety
Manderscheid, Lester V.	12	0.31	0.45	0.00	0.24	Macroeconomics
Myers, Robert S.	13	0.80	0.00	0.00	0.20	International Trade & Price Analysis

Agricultural Economics

Phone: 355-4563

Agricultural Economics

(continued)

Oehmke, James F.	13	0.75	0.00	0.00	0.25	Price Analysis & Research Policy
Peterson, H. Christopher	14	0.40	0.00	0.00	0.60	Agribusiness
Ricks, Donald J.	12	0.20	0.70	0.00	0.10	Marketing
Robison, Lindon J.	12	0.65	0.00	0.00	0.35	Production Economics
Schmid, A. Allan	12	0.60	0.00	0.00	0.40	Land Economics/Public Policy
Schwab, Gerald D.	12	0.20	0.50	0.00	0.30	Farm Management
Schweikhardt, David B.	14	0.25	0.40	0.00	0.35	Agricultural Trade Policy
Shaffer, James D.	12	0.70	0.00	0.00	0.30	Marketing/Agricultural Policy
Staatz, John S.	12	0.25	0.00	0.00	0.75	International Development
Swinton, Scott M.	14	0.70	0.00	0.00	0.30	Production Economics
van Ravenswaay, Eileen O.	12	0.75	0.00	0.00	0.25	Public Policy/Food Safety
Weber, Michael T.	12	0.80	0.00	0.00	0.20	International Development
Yumkella, Kandeh K.	14	0.40	0.00	0.00	0.60	International Trade-Export Marketing
TOTALS:		13.06	3.70	0.00	8.24	

Agricultural Engineering

Phone: 355-4720

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Anderson, James H.	12	0.16	0.17	0.00	0.67	Administration/Power Machinery
Bakker-Arkema, Fred W.	12	0.65	0.00	0.00	0.35	Grain/Dry Storage
Berglund, Kris A.	12	0.49	0.00	0.00	0.51	Biotechnology/Food Engineering
Bickert, William G.	12	0.20	0.80	0.00	0.00	Livestock Facilities/Environment
Bralts, Vincent F.	12	0.50	0.00	0.00	0.50	Soil & Water/International Programs
Brook, Roger C.	12	0.25	0.75	0.00	0.00	Postharvest Handling/Storage & Drying
Burkhardt, Thomas H.	12	0.25	0.00	0.00	0.75	Power & Machine Systems & Storage
Gerrish, John B.	12	0.40	0.00	0.00	0.60	Electronic Robotics
Grulke, Eric A.	12	0.25	0.00	0.00	0.75	Mass Transfer/Separation/Food Engineering
Guyer, Daniel E.	14	0.25	0.75	0.00	0.00	Fruit/Vegetable Storage/Handling
Loudon, Theodore L.	12	0.30	0.70	0.00	0.00	Pollution Management/Irrigation
Merva, George E.	12	0.45	0.00	0.00	0.55	Irrigation/Drainage
Person, Howard L.	13	0.30	0.70	0.00	0.00	Agricultural Structures/Livestock
Segerlind, Larry J.	12	0.35	0.00	0.00	0.65	Finite Element Analysis
Srivastava, Ajit K.	12	0.50	0.00	0.00	0.50	Power & Mach. Systems/Hydraulics
Steffe, James F.	12	0.35	0.00	0.00	0.65	Food Engineering/Rheology
Surbrook, Truman C.	12	0.25	0.00	0.00	0.75	Electrical Technology

Van Ee, Gary R.	13	0.65	0.00	0.00	0.35	Chem. Application/Power & Machinery
Wilkinson, Robert H.	13	0.15	0.60	0.00	0.25	Human Factors Eng./ Chem. Applications
TOTALS:		6.70	4.47	0.00	7.83	

Agricultural Engineering

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Allen, Michael	13	0.50	0.50	0.00	0.00	Forage Nutrition
Aulerich, Richard J.	12	0.75	0.25	0.00	0.00	Fur-Bearing Animals/ Nutrition/Toxicology
Balander, Richard J.	13	0.40	0.00	0.00	0.60	Avian Physiology/ Reproduction
Benson, Margaret	13	0.20	0.50	0.00	0.30	Ruminant Nutrition in Sheep
Bergen, Werner G.	12	0.80	0.00	0.00	0.20	Ruminant Nutrition/ Growth Biology
Bucholtz, Herbert F.	12	0.20	0.80	0.00	0.00	Dairy Nutrition/ Management
Bursian, Steven	12	0.85	0.00	0.00	0.15	Avian Physiology/ Toxicology
Chang, Timothy S.	12	0.85	0.00	0.00	0.15	M&PH/Poultry Pathology
Chou, Karen	14	0.80	0.00	0.00	0.20	Toxicology
Coe, Paul H.	13	0.20	0.00	0.00	0.80	Animal Health
Cook, Robert M.	12	0.80	0.00	0.00	0.20	Ruminant Nutrition
Coussens, Paul M.	13	0.80	0.00	0.00	0.20	Molecular Biology
Dukelow, Richard	12	0.25	0.00	0.00	0.75	Reproductive Physiology
Emery, Roy S.	12	0.80	0.00	0.00	0.20	Ruminant Nutrition
Ferris, Theodore A.	12	0.20	0.80	0.00	0.00	Dairy Genetics
Flegal, Cal J.	12	0.35	0.65	0.00	0.00	Avian Nutrition/ Management
Fogwell, Ralph L.	12	0.60	0.00	0.00	0.40	Physiology
Gill, John L.	12	0.50	0.00	0.00	0.50	Statistics Genetics
Hawkins, David R.	12	0.15	0.00	0.00	0.85	Beef Cattle Nutrition/ Management
Hill, Gretchen M.	13	0.75	0.00	0.00	0.25	Swine Nutrition
Ireland, James J.	12	0.80	0.00	0.00	0.20	Physiology
Mao, Ivan Ling	12	0.75	0.00	0.00	0.25	Dairy Genetics
Ritchie, Harlan D.	12	0.10	0.90	0.00	0.00	Beef Cattle Nutrition/ Management
Rozeboom, Dale	14	0.15	0.70	0.00	0.15	Swine Nutrition/ Management
Rust, Steven	13	0.50	0.50	0.00	0.00	Beef Feedlot Nutrition
Skidmore, Andrew	14	0.25	0.50	0.00	0.25	Dairy Management
Tucker, H. Allen	12	0.80	0.00	0.00	0.20	Physiology/Lactation
VandeHaar, Michael	14	0.65	0.00	0.00	0.35	Dairy Nutrition
Yokoyama, Melvin T.	12	0.85	0.00	0.00	0.15	Animal Nutrition/ Microbiology
TOTALS:		15.60	6.10	0.00	7.30	

Animal Science

Phone: 355-8383

Biochemistry

Phone: 355-1600

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Anderson, Richard L.	12	0.25	0.00	0.00	0.75	Carbohydrate Metabolism
Burton, Zachary	13	0.20	0.00	0.00	0.80	Molecular Biology
Fraker, Pamela J.	12	0.44	0.00	0.00	0.56	Immunology
Holland, John F.	12	0.80	0.00	0.00	0.20	Analytical Biochemistry
Kaguni, Jon M.	13	0.58	0.00	0.00	0.42	Molecular Biology
Kindel, Paul K.	12	0.60	0.00	0.00	0.40	Plant Biochemistry
Kroos, Lee	13	0.60	0.00	0.00	0.40	Molecular Biology
McGroarty, Estelle J.	12	0.40	0.00	0.00	0.60	Lipid/Protein Biochemistry
Preiss, Jack	12	0.10	0.00	0.00	0.90	Plant Biochemistry
Schindler, Melvin	12	0.35	0.00	0.00	0.65	Cell Biology
Triezenberg, Steven	13	0.20	0.00	0.00	0.80	Molecular Biology
Wang, John L.	12	0.20	0.00	0.00	0.80	Cell Biology
Watson, J. Throck	12	0.50	0.00	0.00	0.50	Analytical Biochemistry
TOTALS:		5.22	0.00	0.00	7.78	

Botany & Plant Pathology

Phone: 355-4683

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Adams, Gerard C.	13	0.22	0.60	0.00	0.18	Plant Pathology
Allison, Richard	14	0.90	0.00	0.00	0.10	Molecular Virology
Fulbright, Dennis W.	12	1.00	0.00	0.00	0.00	Wheat Pathology
Hammerschmidt, Raymond	12	0.90	0.00	0.00	0.10	Plant Pathology
Hart, John H.	12	0.50	0.00	0.00	0.50	Plant Pathology
Hart, L. Patrick	12	0.50	0.50	0.00	0.00	Plant Pathology
Hausbeck, Mary K.	14	0.39	0.61	0.00	0.00	Plant Pathology
Jarosz, Andrew	14	0.80	0.00	0.00	0.20	Plant Pathology
Jones, Alan L.	12	0.50	0.50	0.00	0.00	Plant Pathology
Lacy, Melvyn L.	12	0.40	0.50	0.00	0.10	Plant Pathology
Ohlrogge, John	12	0.84	0.00	0.00	0.16	Plant Physiology
Ramsdell, Donald C.	12	0.50	0.50	0.00	0.00	Plant Virology Pathology
Safir, Gene R.	12	0.90	0.00	0.00	0.10	Plant Pathology
Sears, Barbara	13	0.25	0.00	0.00	0.75	Molecular Genetics
Vargas, Joseph M., Jr.	12	0.50	0.15	0.00	0.35	Plant Pathology
TOTALS:		9.10	3.36	0.00	2.54	

Crop & Soil Sciences

Phone: 355-0271

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Anderson, Sharon J.	14	0.75	0.00	0.00	0.25	Surface Soil Chemistry
Boyd, Stephen A.	12	0.75	0.00	0.00	0.25	Organic Chemistry
Branham, Bruce E.	13	0.75	0.00	0.00	0.25	Turfgrass Physiology
Chase, Richard W.	12	0.25	0.65	0.00	0.10	Crop Management
Christenson, Donald R.	12	0.50	0.50	0.00	0.00	Soil Fertilizer Management
Crum, James L.	13	0.25	0.00	0.00	0.75	Soil Class/Genesis
Diers, Brian	14	0.75	0.00	0.00	0.25	Soybean Breeding/Genetics
Douches, David S.	14	0.90	0.00	0.00	0.10	Potato Breeding/Genetics
Ellis, Boyd G.	12	0.50	0.00	0.00	0.50	Soil Chemistry

Crop & Soil Sciences

(continued)

Foster, Eunice F.	12	0.15	0.00	0.00	0.85	Crop Physiology
Freed, Russell D.	12	0.50	0.00	0.00	0.50	International Agronomy/ Plant Breeding
Harpstead, Dale D.	12	0.62	0.14	0.00	0.24	International Agriculture/ Crop Production
Harwood, Richard R.**	12	0.60	0.20	0.00	0.20	Sustainable Agriculture
Hesterman, Oran B.	13	0.23	0.77	0.00	0.00	Alfalfa/Forage Production
Jacobs, Lee W.	12	0.50	0.50	0.00	0.00	Extension Environmental Specialist
Kells, James J., Jr.	12	0.25	0.60	0.00	0.15	Weed Science
Kelly, James D.	13	0.75	0.00	0.00	0.25	Dry Bean Breeding
Knezek, Bernard D.	12	0.50	0.00	0.00	0.50	Micronutrition Waste Utilization
Kunze, Raymond J.	12	0.62	0.00	0.00	0.38	Soil Physics
Leep, Richard H.	12	0.50	0.50	0.00	0.00	Soil Fertilization & Extension
Lenski, Richard E.***	12	0.40	0.00	0.00	0.60	Microbial Ecol. & Evolutionary Biology
Mokma, Delbert L.	12	0.50	0.00	0.00	0.50	Soil Classification/Genesis
Moline, Waldimar J.	12	0.25	0.50	0.00	0.25	Forage Physiology
Penner, Donald	12	0.80	0.00	0.00	0.20	Crop Physiology
Pierce, J. Francis	13	0.70	0.00	0.00	0.30	Soil Management Systems
Renner, Karen A.	13	0.50	0.50	0.00	0.00	Weed Science
Rieke, Paul E.	12	0.35	0.50	0.00	0.15	Turfgrass Management
Ritchie, Joe T.****	12	0.00	0.50	0.50	0.00	Soil Physics/Plant Stress
Robertson, G. Phillip	13	0.38	0.00	0.00	0.62	Ecosystem Ecology
Rogers, John N. III	14	0.25	0.00	0.00	0.75	Turfgrass Management
Smucker, A.J.M.	12	0.75	0.00	0.00	0.25	Soil Biophysics
Thomashow, Michael F.	12	0.76	0.00	0.00	0.24	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.60	0.00	0.00	0.40	Soil Microbiology
Vitosh, Maurice L.	12	0.30	0.70	0.00	0.00	Soil Fertilization Management
Ward, Richard W.	14	0.75	0.00	0.00	0.25	Wheat Breeding
Warncke, Darryl D.	12	0.50	0.50	0.00	0.00	Greenhouse/Vegetable Soil Fert.
TOTALS:		18.41	7.06	0.50	10.03	

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Ayers, George S.	12	0.25	0.00	0.00	0.75	IPM/Apiculture
Bird, George W.	12	0.30	0.50	0.00	0.20	Agricultural Nematology
Bristow, Catherine	13	0.30	0.00	0.00	0.70	Insect Ecology
Edens, Thomas C.	12	0.20	0.00	0.00	0.80	Resource Economics & Policy
Gage, Stuart H.	12	0.50	0.12	0.00	0.38	Env. Sys./Ent. Sur.
Grafius, Edward J.	12	0.30	0.55	0.00	0.15	Vegetable Insect Eco. Management
Haynes, Dean L.	12	0.75	0.00	0.00	0.25	Insect Population Ecology

Entomology

Phone: 355-4662

Entomology

(continued)

Johnson, James W.	14	0.20	0.70	0.00	0.10	Fruit Insect Ecology
Landis, Douglas A.	14	0.35	0.50	0.00	0.15	Field Forage Insects
McCullough, Deborah G.	14	0.30	0.50	0.00	0.20	Forest Entomology
Merritt, Richard W.	12	0.50	0.00	0.00	0.50	Aquatic Insect Ecology
Miller, James R.	12	0.50	0.00	0.00	0.50	Insect Physiology
Raikhel, Alexander S.	12	0.30	0.00	0.00	0.70	Insect Physiology
Smitley, David R.	13	0.25	0.60	0.00	0.15	Landscape/Ornamental Insect Ecology
Stehr, Frederick W.	12	0.50	0.00	0.00	0.50	Insect Biocon./System.
Thiem, Suzanne	14	0.40	0.00	0.00	0.60	Insect Molecular Biology
Walker, Edward D.	14	0.33	0.33	0.00	0.34	Medical/Veterinary Entomology
Whalon, Mark E.	12	0.60	0.00	0.00	0.40	Insect Vector Dynamics
Zabik, Matthew J.	12	0.10	0.00	0.00	0.90	Environmental Toxicology
TOTALS:		6.93	3.80	0.00	8.27	

Family & Child Ecology

Phone: 355-7680

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Imig, David R.	13	0.25	0.00	0.00	0.75	Family Ecology
Keefe, Dennis R.	14	0.50	0.00	0.00	0.50	Family Economics
Keith, Joanne G.	12	0.10	0.80	0.00	0.10	Human Development/Family
Schiamberg, Lawrence R.	12	0.30	0.00	0.00	0.70	Human Development/Family
Walker, Rosemary	12	0.50	0.00	0.00	0.50	Family Economics
TOTALS:		1.65	0.80	0.00	2.55	

Fisheries & Wildlife

Phone: 355-4477

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Campa, Henry III	14	0.50	0.00	0.00	0.50	Wildlife Habitat Ecology
Coon, Thomas G.	14	0.50	0.00	0.00	0.50	Fisheries
Garling, Donald L.	12	0.30	0.50	0.00	0.20	Aquaculture
Giesy, John P.	12	0.55	0.00	0.00	0.45	Toxicology
Haufler, Jonathan B.	12	0.50	0.00	0.00	0.50	Wildlife Ecology/Forest
Kevern, Niles R.	12	0.50	0.00	0.00	0.50	Limnology/Fisheries
McNabb, Clarence D.	12	0.42	0.00	0.00	0.58	Environmental Education
Prince, Harold H.	12	0.55	0.00	0.00	0.45	Waterfowl/Wetlands
Winterstein, Scott R.	13	0.50	0.00	0.00	0.50	Wildlife Biometry
TOTALS:		5.06	0.50	0.00	4.44	

Food Science

Phone: 355-8474

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Booren, Alden M.	12	0.15	0.75	0.00	0.10	Meat/Poultry/Fish
Cash, Jerry N.	12	0.25	0.75	0.00	0.00	Fruit/Vegetable Products
Gray, J. Ian	12	0.25	0.00	0.00	0.75	Food Chemistry
Helferich, William G.	14	0.65	0.00	0.00	0.35	Food Toxicology

Linz, John E.	13	0.50	0.00	0.00	0.50	Food Microbiology
Ng, Perry K. W.	14	0.50	0.00	0.00	0.50	Cereal Science
Ofoli, Robert Y.	13	0.50	0.00	0.00	0.50	Heat/Mass Trsf. of Bio. Sys./Food
Partridge, John A.	13	0.25	0.50	0.00	0.25	Dairy Technology
Pestka, James J.	12	0.50	0.00	0.00	0.50	Food Microbiology
Price, James F.	12	0.50	0.00	0.00	0.50	Meat/Poultry Products
Smith, Denise M.	13	0.60	0.00	0.00	0.40	Poultry/Egg Products
Strasburg, Gale M.	14	0.60	0.00	0.00	0.40	Muscle Biochemistry
Uebersax, Mark A.	12	0.60	0.00	0.00	0.40	Fruit/Vegetable Products
Ustunol, Zeynep	14	0.50	0.00	0.00	0.50	Dairy Foods
TOTALS:		6.35	2.00	0.00	5.65	

Food Science

(continued)

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Dickmann, Donald I.	12	0.70	0.00	0.00	0.30	Tree Physiology
Fried, Jeremy S.	14	0.50	0.00	0.00	0.50	Forest Management
Hart, James B., Jr.	13	0.50	0.00	0.00	0.50	Forest Soils
Kielbaso, Julian J.	12	0.15	0.25	0.00	0.60	Urban Forestry
Lantagne, Douglas O.	13	0.20	0.80	0.00	0.00	Silviculture
Leefers, Larry A.	13	0.50	0.00	0.00	0.50	Forest Economics
Manthy, Robert S.	12	0.50	0.00	0.00	0.50	Forest Economics
McDonough, Maureen H.	12	0.15	0.50	0.00	0.35	Forest Sociology
Potter-Witter, Karen L.	13	0.55	0.35	0.00	0.10	Forest Economics
Pregitzer, Kurt S.	12	0.70	0.00	0.00	0.30	Forest Ecology
Ramm, Carl W.	13	0.60	0.00	0.00	0.40	Forest Biometrics
Stevens, James A.	14	0.60	0.30	0.00	0.10	Trade Economics
Suchsland, Otto M.	12	0.80	0.00	0.00	0.20	Wood Science
TOTALS:		6.45	2.20	0.00	4.35	

Forestry

Phone: 355-0090

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Beaudry, Randolph M.	14	0.50	0.50	0.00	0.00	Postharvest Physiology/ Fruit & Vegetables
Biernbaum, John A.	13	0.20	0.00	0.00	0.80	Plant Physiology/ Floriculture
Bukovac, Martin J.	12	0.90	0.00	0.00	0.10	Plant Physiology/ Pomology
Cameron, Arthur C.	13	0.70	0.00	0.00	0.30	Plant Physiology/ Landscape Hort.
Carlson, William H.	12	0.35	0.50	0.00	0.15	Floriculture/Physiology & Bedding
Dennis, Frank G., Jr.	12	0.40	0.00	0.00	0.60	Plant Physiology/ Pomology
Dilley, David R.	12	0.80	0.00	0.00	0.20	Postharvest Physiology/ Pomology
Ewart, Lowell C.	12	0.60	0.00	0.00	0.40	Floral/Onion Breeding

Horticulture

Phone: 355-5191

Horticulture

(continued)

Flore, James A.	12	0.65	0.00	0.00	0.35	Plant Physiology/ Pomology
Grumet, Rebecca	13	0.90	0.00	0.00	0.10	Vegetable Breeding/ Genetics
Hancock, James F.	12	0.90	0.00	0.00	0.10	Small Fruit Breeding/ Genetics
Hanson, Eric J.	13	0.35	0.65	0.00	0.00	Pomology/Small Fruits
Heins, Royal D.	12	0.75	0.00	0.00	0.25	Plant Physiology/ Floriculture
Herner, Robert C.	12	0.65	0.00	0.00	0.35	Postharvest Physiology/ Vegetables
Howell, Gordon S.	12	0.80	0.00	0.00	0.20	Plant Physiology/ Viticulture/Enology
Hull, Jerome, Jr.	12	0.20	0.80	0.00	0.00	Pomology/Physiology & Culture
Iezzoni, Amy F.	12	0.80	0.00	0.00	0.20	Fruit Breeding/Genetics
Kelly, John F.	12	0.66	0.11	0.00	0.23	Vegetable Composition
Nair, Muraleedharan G.	13	0.50	0.00	0.00	0.50	Natural Products/Chemistry
Perry, Ronald L.	12	0.50	0.50	0.00	0.00	Pomology/Rootstocks
Schutzki, Robert E.	14	0.10	0.00	0.00	0.90	Landscape Horticulture
Sink, Kenneth C.	12	0.75	0.00	0.00	0.25	Genetics/Plant Breeding
Widders, Irvin E.	13	0.75	0.00	0.00	0.25	Vegetable Physiology
Zabadal, Thomas J.	13	0.50	0.50	0.00	0.00	Viticulture
Zandstra, Bernard H.	12	0.25	0.75	0.00	0.00	Vegetable Crops
TOTALS:		14.46	4.31	0.00	6.23	

Human Environment & Design

Phone: 355-7712

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Graham, Richard L.	13	0.25	0.00	0.00	0.75	Interior Design/Hist. Preservation
Slocum, Ann C.	13	0.25	0.00	0.00	0.75	Apparel Design & Textiles
Sontag, M. Suzanne	12	0.25	0.00	0.00	0.75	Apparel Design & Textiles
Sternquist, Brenda J.	12	0.25	0.00	0.00	0.75	Tourism/Merc. Management
TOTALS:		1.00	0.00	0.00	3.00	

Human Nutrition

Phone: 355-7712

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bennink, Maurice R.	12	0.50	0.00	0.00	0.50	Nutrition
Bond, Jenny T.	12	0.40	0.00	0.00	0.60	Nutrition
Chenoweth, Wanda L.	12	0.25	0.00	0.00	0.75	Nutrition
Hoerr, Sharon M.	13	0.25	0.00	0.00	0.75	Community Nutrition
Romsos, Dale R.	12	0.70	0.00	0.00	0.30	Lipid Metabolism
Sawyer, Carol A.	13	0.25	0.00	0.00	0.75	Food Service Management
Schemmel, Rachelle A.	12	0.30	0.00	0.00	0.70	Nutrition
Song, Won O.	13	0.25	0.00	0.00	0.75	Nutrition
Zabik, Mary E.	12	0.20	0.00	0.00	0.80	Foods
Zile, Maija H.	12	0.50	0.00	0.00	0.50	Nutrition
TOTALS:		3.60	0.00	0.00	6.40	

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bush, Guy L.	12	0.10	0.00	0.00	0.90	Genetics
TOTALS:		0.10	0.00	0.00	0.90	

Kellogg Biological Station

Phone: 353-9445

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Baker, John C.	12	0.20	0.00	0.00	0.80	Bovine Respiratory Diseases
Erskine, Ronald J.	14	0.25	0.33	0.00	0.42	Mastitis in Dairy Cattle
Herd, Thomas H.	13	0.25	0.00	0.00	0.75	Nutrition & Metabolic Diseases of Cattle
Holland, Robert E.	13	0.34	0.00	0.00	0.66	Bovine Enteric Disease
Kaneene, John B.	12	0.14	0.00	0.00	0.86	Epidemiology/Disease Impact
Robinson, Norman E.	12	0.25	0.00	0.00	0.75	Respiratory Physiology
Thacker, Brad J.	13	0.28	0.30	0.00	0.42	Swine Medicine
TOTALS:		1.71	0.63	0.00	4.66	

Large Animal Clinical Sciences

Phone: 355-9593

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Breznak, John A.	12	0.30	0.00	0.00	0.70	Microbial Ecology
Champness, Wendy C.	13	0.50	0.00	0.00	0.50	Microbial Genetics
Dazzo, Frank B.	12	0.80	0.00	0.00	0.20	Microbial Ecology
de Bruijn, Frans J.	13	0.29	0.00	0.00	0.71	Molecular Biology
Hausinger, Robert P.	13	0.40	0.00	0.00	0.60	Microbial Physiology
Klug, Michael J.	12	0.25	0.00	0.00	0.75	Microbial Ecology
Maes, Roger K.	12	0.03	0.00	0.00	0.97	Virology
Reddy, C. Adinarayana	12	0.46	0.00	0.00	0.54	Microbial Physiology/ Ecology
Schmidt, Thomas M.	14	0.40	0.00	0.00	0.60	Microbial Ecology
Thomashow, Michael F.	12	0.14	0.00	0.00	0.86	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.15	0.00	0.00	0.85	Soil Microbiology
Uffen, Robert L.	12	0.49	0.00	0.00	0.51	Microbial Physiology
Velicer, Leland F.	12	0.30	0.00	0.00	0.70	Virology
TOTALS:		4.51	0.00	0.00	8.49	

Microbiology

Phone: 355-6463

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Giacin, Jack R.	12	0.59	0.00	0.00	0.41	Package Product Interaction
Hernandez, Ruben J.	14	0.25	0.00	0.00	0.75	Package Product Interaction
Lee, Julian J. L.	13	0.20	0.00	0.00	0.80	CAP/MAP & Protective Packaging

Packaging

Phone: 355-9580

Packaging

(continued)

Downes, Theron W.	12	0.20	0.00	0.00	0.80	Quality of Packaged Food
Singh, Sher Paul	13	0.20	0.00	0.00	0.80	Dist./Trans./Envir. Meas./Pkg. Dyn.
TOTALS:		1.44	0.00	0.00	3.56	

Park & Recreation Resources

Phone: 353-5190

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Fridgen, Joseph D.	12	0.60	0.00	0.00	0.40	Leisure/Env. Perc.
Holecek, Donald F.	12	0.75	0.25	0.00	0.00	Resource Economics/ Tourism
Nelson, Charles M.	14	0.25	0.00	0.00	0.75	Outdoor Recreation Resource Mang.
Stynes, Daniel J.	12	0.50	0.00	0.00	0.50	System Analysis & Planning
Vander Stoep, Gail A.	14	0.25	0.25	0.00	0.50	Communications/Human Dimensions
TOTALS:		2.35	0.50	0.00	2.15	

Pathology

Phone: 353-9160

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bell, Thomas G.	12	0.25	0.00	0.00	0.75	Comparative Pathology/ Platelet Function
Grimes, Sheila D.	14	0.36	0.00	0.00	0.64	Enteric Diseases of Animals
Padgett, George A.	12	0.25	0.00	0.00	0.75	Comparative Veterinary Pathology
Patterson, Jon S.	13	0.25	0.00	0.00	0.75	Vet. Pathology/Infectious Dis./Animals
Render, James A.	13	0.23	0.00	0.00	0.77	Ophthalmic Pathology
TOTALS:		1.34	0.00	0.00	3.66	

Pesticide Research Center

Phone: 353-9430

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Olsen, Larry G.	13	0.10	0.75	0.00	0.15	Pesticide Education & IPM
Zabik, Matthew J.	12	0.84	0.00	0.00	0.16	Chemical Fate/Residue Analysis
TOTALS:		0.94	0.75	0.00	0.31	

Physiology

Phone: 355-6475

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Dukelow, W. Richard	12	0.40	0.00	0.00	0.60	Reproductive Physiology
Hootman, Seth R.	13	0.50	0.00	0.00	0.50	Cellular Physiology
Zipser, Birgit	12	0.47	0.00	0.00	0.53	Cell Biology
TOTALS:		1.37	0.00	0.00	1.63	

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
de Bruijn, Frans J.	13	0.31	0.00	0.00	0.69	Molecular Biology
Somerville, Shauna	13	0.75	0.00	0.00	0.25	Plant Pathology
TOTALS:		1.06	0.00	0.00	0.94	

Plant Research Lab (MSU-DOE)

Phone: 353-2270

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Axinn, George	12	0.50	0.00	0.00	0.50	Community & Regional Development
Bronstein, Daniel A.	12	0.40	0.00	0.00	0.60	Environmental Policy & Law
Dersch, Eckhart	12	0.17	0.61	0.00	0.22	Natural Resources Management
Edens, Thomas C.	12	0.80	0.00	0.00	0.20	Resource Economics & Policy
Kakela, Peter J.	12	0.80	0.00	0.00	0.20	Natural Resources Management
Kimball, William J.	12	0.10	0.70	0.00	0.20	Community & Regional Development
Schultink, Gerhardus	13	0.25	0.00	0.00	0.75	Natural Resources Management
TOTALS:		3.02	1.31	0.00	2.67	

Resource Development

Phone: 355-3421

	RANK	MAES	MSUE	GRANT	JOINT	AREA OF INTEREST
Bokemeier, Janet L.	12	0.50	0.00	0.00	0.50	Farm Family/Labor Markets
Busch, Lawrence M.	12	0.50	0.00	0.00	0.50	Struc. of Agr. Sci./Agr. Res. Pol.
Harris, Craig K.	13	0.50	0.00	0.00	0.50	Sociology of Agriculture
Johnson, Nan E.	12	0.50	0.00	0.00	0.50	Demography
Schwarzweiler, Harry K.	12	0.50	0.00	0.00	0.50	Sociology of Agriculture
TOTALS:		2.50	0.00	0.00	2.50	

Sociology

Phone: 355-6632

GRAND TOTALS	134.73	42.39	0.50	117.38
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* Elton Smith Endowed Chair

** C.S. Mott Distinguished Professor of Sustainable Agriculture

*** Hannah Professor for Microbial Ecology and Plant Sciences

**** Nowlin Professor for Water Research

List of Active MAES Projects* by Department

*Signifies Regional Research Project
As of 10-1-93



Ag & Extension Education

Project 3314	Educational Perspectives of Agricultural Researchers and Scientists	Levine, S.
Project 3316	Assessing Retailer/Consumer Perceptions and Use of Michigan Produced Commodities	Heinze, K.

Agricultural Economics

Project 996	Assessments of Consumer Reactions to New Food Products and Marketing Services	Zehner, M.
Project 1502	The Performance of Coordinating Functions and Institutions of the U.S. Food System	Staatz, J.
Project 1518*	Benefits and Costs in Natural Resource Planning	Hoehn, J.
Project 1519*	Private Strategies, Public Policies and Food System Performance	van Ravenswaay, E.
Project 1530*	Economic Issues Affecting the U.S. Fruit and Vegetable System	Ricks, D.
Project 1567*	Quantifying Long-Run Agricultural Risks and Evaluating Farmer Responses to Risk	Robison, L.
Project 1572	Agricultural and Rural Institutions in Productivity and Growth	Bonnen, J.
Project 1576*	Farm Information Systems	Harsh, S.
Project 1592*	Analyses of Selected Economic Factors Affecting the Long-Run Viability of the Northern Dairy Industry	Hamm, L.
Project 1618*	Modeling Responses of Growing Pigs	Schwab, G.
Project 1625	Financial Decision Making and Investment in Agriculture	Hanson, S.
Project 1635	Collective Action in Agriculture, Natural Resources and Rural Development	Schmid, A.
Project 1650	Effects of Macroeconomic Fluctuations and Government Stabilization Policies on U.S. Agriculture	Myers, R.
Project 1653	The Political Economy of U.S. Agricultural Research, Commodity and Trade Policy	Oehmke, J.
Project 1660*	Regulatory, Efficiency and Management Issues Affecting Rural Financial Markets	Hanson, S.
Project 1666*	Impact Analyses and Decision Strategies for Agricultural Research	Oehmke, J.
Project 1669	Developing Econometric Models for the Agricultural and Food Sectors	Ferris, J.
Project 1682	Application of Present Value Techniques for Financing, Design and Selection of Durables	Robison, L.
Project 1690	Livestock Health Management Economics and the Safety of Animal-Origin Foods	Lloyd, J.
Project 1702	Economic Institutions, Organizational Behavior and Food Systems Performance	Shaffer, J.
Project 1709	Assessment of Policies for Improving Environmental Quality	Graham-Tomasi, T.

Project 1712	Agricultural Production Economics and Environmental Risk Management	Swinton, S.
Project 1713	Agribusiness Competitiveness and Management Strategies	Peterson, H.
Project 1721	Global Agribusiness Marketing Research for Michigan Food and Agribusiness Industries	Yumkella, K.
Project 3333	Improved Marketing and Marketing Systems for Fruits and Vegetables	Ricks, D.
Project 3800	Risk Perception, Measurement and Analysis: Groundwater, Food and Rural Areas	Hoehn, J.
Project 3806	Engineering and Economic Potential for Wet and Dry Manure Products On-Farm and in the Marketplace	Schwab, G.
Project 3807	An Analysis of the Status of Michigan Agriculture and Research and Extension Implications	Ferris, J.
Project 3809	Financial Evaluation of Alternative Production Strategies for Michigan Dairy Farms	Harsh, S.
Project 3812	Evaluating Alternative Design and Management Systems for the Michigan Beef Cattle Industry	Black, J.

Agricultural Economics

(continued)

Project 1245*	Improvement of Thermal Processes for Food	Steffe, J.
Project 1564*	The Effect of Water Table Management on Productivity and Water Quality	Merva, G.
Project 1577	Systems for Value-Added Processing of Food and Agricultural Products	Srivastava, A.
Project 1578	Water Management and Transport in Biological and Agricultural Systems	Merva, G.
Project 1579	Development of Machine Concepts for Mechanized Agriculture	Ledebuhr, R.
Project 1580	Storage and Handling of Agricultural Crops	Brook, R.
Project 1581	Value-Added Quality Control Techniques in the Postharvest Stages of Fruit and Vegetable Products	Guyer, D.
Project 1582	Sensors and Automatic Control in Agriculture	Gerrish, J.
Project 1583	Development of Chemical Application Technology for the Agribusiness Industry	Van Ee, G.
Project 1591*	Micro-Irrigation for Optimum Crop Productivity and Minimum Groundwater Contamination	Bralts, V.
Project 1594	Influence of Environment on Animal Performance and Behavior	Bickert, W.
Project 1603	Modelling Machinery Systems for Field Crop Production	Burkhardt, T.
Project 1627*	Microirrigation of Horticultural Crops in Humid Regions	Bralts, V.
Project 1659	Design, Evaluation and Management of Irrigation Systems	Bralts, V.
Project 1676*	Technology and Principles for Assessing and Retaining Quality of Fruits and Vegetables	Srivastava, A.
Project 1686	Engineering Science and Design of Solid Fermentations	Gulke, E.
Project 1695*	Integrated Systems for Improved Water and Nitrogen Management in Irrigation Environments	Loudon, T.
Project 1704	Computational Methods in Food and Agricultural Engineering	Segerlind, L.
Project 1706	Interactions and Surface Phenomena of Colloids and Biopolymers	Ofoli, R.
Project 3293	Great Lakes Influence on Michigan Climate	Nurnberger, F.
Project 3303	Deposition Efficiency of Chemical Application	Wilkinson, R.
Project 3329	Electrical Power and Control Applications in Agriculture	Surbrook, T.
Project 3344	Alternative Systems Development for Sustainable Pasture Rearing of Swine in an Intensive Land Use Environment	Person, H.

Agricultural Engineering

Agricultural Engineering

(continued)

Project 7560	Bioprocessing for Utilization of Agricultural Raw Materials	Berglund, K.
Project 7574	Animal Waste Management Strategies for Michigan	von Bernuth, R.
Project 7576	Water Quality Impacts of Water Table Management	Belcher, H.
Project 7594	Animal Manure Management Strategies for Michigan	Loudon, T.
Project 7595	Water Quality Impacts of Water Table Management	Belcher, H.

Anatomy

Project 6860	Peptidergic Mediation of Arthritis/Laminitis Disease	Bowker, R.
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Animal Science

Project 44	Biological and Biochemical Effects of Certain Nutritional and Physical Factors in Swine	Miller, E.
Project 859	Hormonal Control of Reproduction in Cattle, Sheep and Swine	Dukelow, W.
Project 1039	Fur Animal Studies (Mink)	Aulerich, R.
Project 1156*	Dairy Herd Management Strategies for Improved Decision Making and Profitability	Skidmore, A.
Project 1163	Factors Controlling Growth and Lactation	Tucker, H.
Project 1178	Breeding Strategies to Maximize Economic Gain in Dairy Cattle Production	Mao, I.
Project 1182*	Factors Regulating Protein Synthesis, Degradation and Growth in Skeletal Muscle	Bergen, W.
Project 1196*	Methods for Improvement of Fertility in Cows Postpartum	Fogwell, R.
Project 1226	Protein and Amino Acid Nutrition and Metabolism in Ruminants	Bergen, W.
Project 1278	Improvement of Design and Analysis of Animal Experiments	Gill, J.
Project 1318	Utilization of Fiber by Ruminants	Cook, R.
Project 1437	Increasing Milk Solids Secretion	Emery, R.
Project 1521*	Metabolic Relationships in Supply of Nutrients for Lactating Cows	Emery, R.
Project 1573	The Physiological Role of Ovarian Inhibins	Ireland, J.
Project 1575*	Increased Efficiency of Sheep Production	Benson, M.
Project 1596*	The Genetics of Body Composition in Beef	Ritchie, H.
Project 1604	Nutritional Regulation of Protein Production in Ruminants	VandeHaar, M.
Project 1616	Regulation of Skeletal Muscle Growth by Sex Steroids and Growth Modifiers	Merkel, R.
Project 1622	Automated In-Vitro Test System for Chemical Toxicity in Mammalian Sperm	Chou, K.
Project 1639	Comparative Nutrition and Physiology of Wild Animals	Ullrey, D.
Project 1643	Microbial Ecology of the Rumen, Gastrointestinal Tract and Ensiled Feeds	Yokoyama, M.
Project 1645	Using Traditional and Non-Traditional Pedigree Information to Select Bulls for AI Sampling Programs	Ferris, T.
Project 1652*	Assessment of Technological Changes in Forage-Dairy Production Systems Using Computer Modeling	Allen, M.
Project 1675	Molecular Characterization of Marek's Disease Virus (MDV)	Coussens, P.
Project 1691*	Genetic Improvement of Dairy Cattle Using Molecular Markers	Ferris, T.
Project 1725	Maximum Utilization of Michigan-Grown Feedstuffs for Growing-Finishing Cattle	Rust, S.

Animal Science

(continued)

Project 3047	Feeding and Management Regimes for Efficient Utilization of Michigan Feedstuffs by Beef Cattle	Ritchie, H.
Project 3117	Nutrition and Physiology of the Horse	Ullrey, D.
Project 3217	The Fate and Biological Effects of Xenobiotics in Farm Animal Species	Bursian, S.
Project 3304	Basic and Applied Studies Utilizing Domestic and Semi-Domestic Avian Species as Research Animals	Balander, R.
Project 3307	Optimizing the Nutritional Utilization of Forages by Dairy Cattle	Allen, M.
Project 3325	Management Studies in Poultry to Include Waste Handling/Utilization	Flegal, C.
Project 3340	Nutrition and Feeding Management for Michigan Dairy Herds	Bucholtz, H.
Project 3341	Corpora Lutea and Reproduction in Lactating Dairy Cows	Fogwell, R.
Project 3342	Dairy Herd Management Strategies for Improved Profitability and Productivity	Skidmore, A.
Project 3347	Avian Disease Studies	Chang, T.
Project 6845	Characterizations of Shifts in Cecal Bacterial Fermentation Induced by Growth Promoting Antibiotics	Yokoyama, M.
Project 6871	Pretranslational Control of Adipose Depot Lipogenesis During the Dry Period of Dairy Cows	Bergen, W.
Project 6872	Energy Balance, Insulin-Like Growth Factor I and Reproductive Health	VandeHaar, M.
Project 7568	Development of Recombinant Marek's Disease Vaccine Virus	Coussens, P.
Project 8073	The Role of Inhibins in Ovarian Function	Ireland, J.
Project 8102	Aminergic Regulation of Growth Hormone Secretion in Cattle	Tucker, H.
Project 8104	Functional Role of Bacteriophages in the Rumen Ecosystem	Yokoyama, M.
Project 8118	Regulatory Regions of Marek's Disease Virus: Transactivation	Coussens, P.

Biochemistry

Project 1219	Plant Respiration	Tolbert, N.
Project 1223	The Interrelationships Between Dietary Zinc Status and Immune Function	Fraker, P.
Project 1290*	Regulation of Photosynthetic Processes	Preiss, J.
Project 1503	Regulation of Starch Metabolism in Photosynthetic and Non-Photosynthetic Processes	Preiss, J.
Project 1543	Role of Carnitine Acyltransferases in the Regulation of Cellular Metabolism	Bieber, L.
Project 1546	Development of a Computerized Fluorimeter and its Application to Chemical and Biochemical Problems	Holland, J.
Project 1547	Development of Quantitative Vapor Phase Methodology for Steroids	Watson, J.
Project 1586	Molecular Mechanisms of Action of Halogenated Aromatic Hydrocarbons	Denison, M.
Project 1598	Temporal and Spatial Gene Regulation in <i>Bacillus subtilis</i>	Kroos, L.
Project 1601	DNA Replication and its Regulation in <i>Escherichia coli</i>	Kaguni, J.
Project 1608	Activation of Gene Expression by a Herpes Simplex Virion Protein	Triezenberg, S.
Project 1609	Regulation of Expression of a Lectin in Senescent Fibroblasts	Anderson, R.
Project 1610	Transcription Factors that Bind to RNA Polymerase II	Burton, Z.
Project 1614	Interaction of Rhizobium with Soybean Cells	Wang, J.
Project 1621	Transmembrane and Intracellular Signalling in Soybean Cells	Schindler, M.
Project 1668	Detection and Characterization of Two Different Structural Types of Pectic Polysaccharides in Plants	Kindel, P.
Project 1683	Analysis of LPs from Strains of <i>Pseudomonas syringae</i> pv. <i>morsrunorum</i> with Altered Virulence	McGroarty, E.

Botany & Plant Pathology

Project 1176	Diseases of Woody Plants — Biology and Control	Hart, J.
Project 1206*	Biocontrol of Soil-Borne Plant Pathogens	Safir, G.
Project 1259*	Occurrence of Mycotoxins and the Implications to Animal and Human Health	Hart, L.
Project 1408*	Biological Improvement of Chestnut and Management of the Chestnut Blight Fungus	Fulbright, D.
Project 1491	Molecular Evolution, Systematics and Population Biology of Pathogenic Fungi	Adams, G.
Project 1499	Environmental and Chemical Determinants of VA Mycorrhizal Root Colonization	Safir, G.
Project 1533	Genetic Engineering of Oilseed Crops	Ohlrogge, J.
Project 1562	Physiology of Resistance and Induced Resistance to Disease in Potato	Hammerschmidt, R.
Project 1648	Mechanisms of Disease Resistance in Plants	Somerville, S.
Project 1655	Molecular Analysis of the Aphid Transmission of Pea Enation Mosaic	de Zoten, G.
Project 1656	Identification of Plant Virus Host Specificity Determinants	Allison, R.
Project 1657	Diseases of Muck Vegetables, Potatoes, and Mint Crops and Their Control	Lacy, M.
Project 1662	Virulence Inhibition Factors and Their Effects on Plant Pathogen Populations	Fulbright, D.
Project 1671	Tissue Culture and Molecular Biology Techniques for the Study of a Plant-Pathogenic Organism	Sears, B.
Project 1673	Biology and Control of the Fungi That Cause Diseases of Field Crops	Hart, L.
Project 1679	Plastome Mutator of <i>Oenothera</i>	Sears, B.
Project 1703	Pathogen Population Biology as a Tool in Developing IPM Strategies	Jarosz, A.
Project 1711	Development and Testing of Molecular Probes for Detection of Pathogens in Symptomless Conifers	Adams, G.
Project 1718	Diseases of Upland Vegetables, Greenhouse Ornamentals and Vegetable Transplants and Their Control	Hausbeck, M.
Project 3183	Diseases of Tree Fruit Crops and Their Control	Jones, A.
Project 3315	Etiology, Epidemiology and Control of Fungal Diseases of Small Fruit	Ramsdell, D.
Project 3317	Management of Turfgrass Diseases	Vargas, J.
Project 3805	No Carcinogen/Zero Pesticide Residue Production System for Apples	Jones, A.
Project 7552	Development of Fusarium Yellowing Disease Resistance in Celery	Lacy, M.
Project 7588	Potential for RNA Recombination in Virus Resistant Transgenic Plants	Allison, R.
Project 7590	Asparagus Decline Syndrome and Replant Problem in Michigan	Hausbeck, M.
Project 7596	Development of Fusarium Yellowing Disease Resistance in Celery	Lacy, M.
Project 8059	Center for Genetic and Biochemical Alteration of Plant Lipids and Starch	Ohlrogge, J.
Project 8087	Characterization of Induced Systemic Resistance Signal Molecules	Hammerschmidt, R.
Project 8091	Population Biology of Leucostoma-Causing Canker of Stone Fruit Trees	Adams, G.
Project 8092	Physiological Basis for Tissue Specificity of Plant-Pathogenic MLOs	Klomprens, K.
Project 8093	Identification of Molecular Markers Adjacent to the M1-a Locus in Barley	Somerville, S.
Project 8110	In vitro Analysis of Plant-Pathogenic Mycoplasma-like Organisms	Sears, B.
Project 8115	Respiratory Defects in Hypovirulent Strains of <i>Cryphonectria parasitica</i>	Fulbright, D.
Project 8120	Characterization of the Sesquiterpene Cyclase from Potato	Zook, M.

Chemistry

Project 8112	Charge Separation and Stabilization in Chloroplast Photosystem II	Babcock, G.
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Crop & Soil Sciences

Project 319	Classification, Genesis and Evaluation of Michigan Soils	Mokma, D.
Project 569	Breeding and Testing Small Grain Cultivars for Michigan	Freed, R.
Project 908	Fundamental Factors in Cultural and Chemical Weed Control, Weed Competition and Weed Life Cycles	Renner, K.
Project 1103	Adsorption, Transformation and Release of Inorganic Nutrients by Soils	Ellis, B.
Project 1124	Efficient Use of Plant Nutrients	Vitosh, M.
Project 1462*	Impact of Accelerated Erosion on Soil Properties and Productivity	Mokma, D.
Project 1471*	Chemistry and Bioavailability of Waste Constituents in Soils	Jacobs, L.
Project 1526	Role of Microorganisms in Plant Nutrition	Paul, E.
Project 1538	Harvestability & Processing Quality of Sugarbeet Roots	Theurer, J.
Project 1561*	Forage Protein Characterization and Utilization for Cattle	Hesterman, O.
Project 1568	Plant Biotechnology: Molecular Approaches to Improve Plant Stress Tolerance	Thomashow, M.
Project 1574	Movement and Degradation of Organic Contaminants in Soils and Sediments	Boyd, S.
Project 1587	The Physiology and Biochemistry of Herbicide Action, Selectivity and Degradation	Penner, D.
Project 1595	Impact Absorption, Traction and Wear Tolerance Investigations on Turf and Soil Surfaces	Rogers, J.
Project 1600	Microbial Ecology of Denitrification and Biodegradation	Tiedje, J.
Project 1615	Influence of Mineral-Organic Interactions on Colloid and Pollutant Transport Properties	Anderson, S.
Project 1617*	Biological and Ecological Basis for a Weed Management Model to Reduce Herbicide Use in Corn	Kells, J.
Project 1619*	Environmental and Genotypic Control of Assimilate Allocation in Grain Crops	Smucker, A.
Project 1626	Potato Breeding and Genetics	Douches, D.
Project 1630*	Nutrient Management to Sustain Productivity While Protecting Surface and Groundwater Quality	Ellis, B.
Project 1654	Genetic Improvement of Beans (<i>Phaseolus vulgaris</i> L.) For Yield, Pest Resistance and Food Value	Kelly, J.
Project 1661	Potential for Groundwater Contamination from Pesticides and Nutrients Used on Turf	Branham, B.
Project 1670	Assessment and Simulation of the Water, Nutrient and Agricultural Chemical Dynamics in Field Crop Production	Ritchie, J.
Project 1685	Crop Rotation Effects on Soil Microbial Activity, Nutrient Use Efficiency and Productivity	Harwood, R.
Project 1687	Trace Gas Fluxes in Agricultural Landscapes	Robertson, G.
Project 1692	Evolutionary Ecology of Microbial Populations	Lenski, R.
Project 1714	Enhancing Profitability and Sustainability of Crop Production Systems for Farmers	Hesterman, O.
Project 1717	Soybean Breeding and Genetics	Diers, B.
Project 3122	Development & Correlation of Soil Test Procedures with Crop Yields & Plant Nutrient Contents	Warncke, D.
Project 3128	Systems of Cropping	Christenson, D.

Crop & Soil Sciences

(continued)

Project 3253	Computer Simulation of Soil Water Infiltration into Michigan Soils	Kunze, R.
Project 3260	Crop Management Studies in Northern Michigan	Leep, R.
Project 3295	Cultural and Management Factors Affecting Potato Quality	Chase, R.
Project 3296	Weed Management as a Component of Field Crop Production Systems in Michigan	Kells, J.
Project 3300	Design of Experiments	Cress, C.
Project 3301	Soils and Landscapes of Michigan	Crum, J.
Project 3302	Management of Organic Soils for Crop Production	Warncke, D.
Project 3313	Cultivation and Topdressing Effects on Turf and Soil	Rieke, P.
Project 3319	Wheat Breeding and Genetics	Ward, R.
Project 3324	Strategies of Drought Resistance in Beans (<i>Phaseolus vulgaris</i> L.)	Foster, E.
Project 3335	Soil Biophysical Mechanisms of Functional Plant Roots in Crops of Agroecosystems	Smucker, A.
Project 3336	Maize Breeding and Production Management	Harpstead, D.
Project 3802	Development of Production, Marketing and Utilization of Canola as an Alternative Crop in Michigan	Copeland, L.
Project 3808	Development of Systems to Meet Environmental Constraints of Cash Crop Production in the 1990s	Pierce, F.
Project 3810	Evaluating Grasses and Grass-Legume Mixtures for Sustainable and Efficient Forage Production	Moline, W.
Project 3811	User-Friendly Methodology for Managing Animal Manure and Fertilizer Nutrients Within Livestock and Crop Production Enterprises	Jacobs, L.
Project 7564	Stratification and Fate of N Within Soil Profiles: Management-Induced Changes	Pierce, F.
Project 7566	Assessment and Modeling of Nitrate Leaching Under Conventional and Organically Managed Corn	Paul, E.
Project 7580	Resource Efficient Cropping Systems for Dry Bean and Sugar Beet Production	Christenson, D.
Project 7586	Improved Production and Utilization Technology for Michigan Potatoes	Douches, D.
Project 7591	Management Effects on Colloid-Enhanced Transport of Herbicides and Phosphorus	Anderson, S.
Project 7598	Alfalfa-Grass Intercrops: A Preventative Pest Management System for Weeds and Insects	Hesterman, O.
Project 8107	Primisulfuron Sorption, Diffusion and Degradation in Soils — 19F NMR Study	Anderson, S.
Project 8114	Regulation of Gene Expression in Response to Cold Temperatures	Thomashow, M.

Entomology

Project 401	Apiculture and Crop Pollination	Hoopingarner, R.
Project 1067*	Variables in Agricultural Weather Information Systems	Gage, S.
Project 1187	Biological Control of Selected Insect Pests in Michigan	Stehr, F.
Project 1213	Management of Defoliating Insects and Related Secondary Insects	Scriber, M.
Project 1294*	Black Fly Damage Thresholds, Biology and Control	Merritt, R.
Project 1331*	Interaction of Nematode-Host Variability and Abiotic	Bird, G.
Project 1563*	Spatial Dynamics of Leafhopper Pests and Their Management on Alfalfa	Whalon, M.
Project 1584*	Design and Evaluation of New Approaches for the Management of Plant-Parasitic Nematodes	Bird, G.

Entomology

(continued)

Project 1606	Management of Insect and Mite Pests of Greenhouse, Landscape and Turfgrass	Smitley, D.
Project 1611	Insect Management: An Ecosystem Analysis Approach for Preventive Pest Management	Haynes, D.
Project 1613	Factors Regulating Insect Host-Plant Colonization	Miller, J.
Project 1640*	Integrated Crop Management Effects on Stalk-Boring Lepidoptera	Scriber, M.
Project 1644	Plant Chemical Defenses, Insect Counter-Adaptations and Factors Affecting Gene Flow in a Hybrid Zone	Scriber, M.
Project 1663	Biology and Management of Insect Pests of Vegetable Crops	Grafius, E.
Project 1696	Temporal and Spatial Dynamics of Insects in Diverse Landscapes: A Risk Assessment Perspective	Gage, S.
Project 1698	Development of Arthropod Resistance Management Systems	Whalon, M.
Project 1700	Influence of Gypsy Moth Defoliation on Native Forest Arthropods	McCullough, D.
Project 1710	Ecological Impacts and Management of Forest Insects in Michigan	McCullough, D.
Project 1722*	Ecology and Impact of Gypsy Moth Invasion	Scriber, M.
Project 3269	Using Behavior to Reduce Non-Target Impact of Pesticides	Ayers, G.
Project 3294	Michigan State University Insect Museum	Stehr, F.
Project 3299	Management of Field and Forage Crop Insects in Michigan	Landis, D.
Project 3320	Biology and Management of Nematodes Associated with Michigan Agriculture and Natural Resources	Bird, G.
Project 3327	Biology and Control of Biting Flies in Michigan	Merritt, R.
Project 3338	Ecology and Management of Arthropod Vector Populations and Vector-Borne Diseases	Walker, E.
Project 3346	Biology and Management of Tree Fruit Insects	Johnson, J.
Project 7587	Management of Dispersal of Colorado Potato Beetle in Crop Rotational Systems	Grafius, E.
Project 8074	Isolation, Identification, and Behavioral Effects of Onion Fly Sex Peptide	Miller, J.
Project 8088	Effect of Carbohydrates on Predaceous Activity of the Allegheny Mound Ant	Bristow, C.

Family & Child Ecology

Project 1523*	Family Business: Interaction in Work and Family Spheres	Walker, R.
Project 1590*	Housing Transitions of the Maturing Population: Consequences for Rural/Nonmetropolitan Communities in the Western Region	Schiamberg, L.
Project 1705	Retirement Transitions of the Maturing Population and Consequences for Rural/Urban Communities,	Schiamberg, L.
Project 3334	Family-Environment & Transactions: Effects on Economic Well-Being and Michigan Families' Life Quality	Keefe, D.
Project 3349	Types of Family Structure as Related to Michigan Farm-Family Business Management Practices	Imig, D.
Project 3801	Economic, Social and Personal Well-Being of Michigan Farm Families in Transition	Walker, R.

Fisheries & Wildlife

Project 1414	Fates and Effects of Trace Contaminants in Aquatic Systems	Giesy, J.
Project 1531	Modeling Avian Population Dynamics: Juvenile Dispersal Patterns & Reproductive Strategies	Winterstein, S.
Project 1540	Ecology, Population Dynamics and Management of Michigan Fishes and Their Food Organisms	Taylor, W.
Project 1552	Wildlife Responses to Forest Management in Michigan	Haufler, J.
Project 1624*	Avian Species in Diverted Farmland	Winterstein, S.
Project 1646	Wildlife Responses to Habitat Management	Campa, H.
Project 1701	Evaluation of Primary and Secondary Production Compared to the Basic Fertility of Lakes and Streams	Kevern, N.
Project 1707	Habitat and its Effects on the Ecology and Management of Fishes	Coon, T.
Project 1716	Environmental and Genetic Components of Reproduction in Bird Populations	Prince, H.
Project 3077	Environmental and Genetic Components of Reproduction in Bird Populations	Prince, H.
Project 3248	Improving Productive Public Involvement in Agriculture and Natural Resource Problem Solving	Peyton, R.
Project 3254	Development of Commercial Fish Culture Techniques for Michigan	Garling, D.
Project 3292	Food Resource Base for Young-of-the-Year Fish Production in Great Lakes Wetlands	McNabb, C.
Project 3804	Economic Feasibility of Culturing Fish Species that Offer Economic Potential in Michigan	McNabb, C.
Project 7557	Regional Aquaculture Center	McNabb, C.
Project 9001	Support for a National Coordinator for Aquaculture INAD (Investigational New Animal Drug) Applications	Batterson, T.
Project 10002	Regional Aquaculture Center	McNabb, C.
Project 10003	Regional Aquaculture Center	McNabb, C.
Project 10004	Regional Aquaculture Center	Batterson, T.
Project 10005	North Central Regional Aquaculture Center	Batterson, T.

Food Science & Human Nutrition

Project 1193	Factors Affecting Absorption and Utilization of Nutrients	Chenoweth, W.
Project 1209	Quality of Fresh and Processed Meat Products	Price, J.
Project 1211	Dietary Fat/Carbohydrate Relationships to Selected Health Parameters	Schemmel, R.
Project 1323	Improving Process Efficiency, Product Quality and Nutrient Composition of Fruit and Vegetable Products	Uebersax, M.
Project 1413	Metabolism and Function of Vitamin A	Zile, M.
Project 1419	Processing Treatments Influencing Functional Properties and Utilization of Muscle Foods	Booren, A.
Project 1444*	Health Maintenance Aspects of Dietary Recommendations Designed to Modify Lipid Metabolism	Romsos, D.
Project 1448	Microbial Food-Borne Diseases	Pestka, J.
Project 1478*	Genetic Improvement of Beans (<i>Phaseolus vulgaris</i> L.) For Yield, Pest Resistance and Food Value	Uebersax, M.
Project 1506*	Development of New Processes and Technologies for the Processing of Poultry Products	Smith, D.
Project 1511	Regulation of Cell Development in Filamentous Fungi	Linz, J.
Project 1527	Cook/Chill Foodservice Systems: Shelf Life of Precooked Chilled Foods	Sawyer, C.

Food Science & Human Nutrition

(continued)

Project 1532*	Functional Properties of Food Proteins	Smith, D.
Project 1597	Food Toxicology and Safety	Helferich, W.
Project 1599	Regulation of Calcium in Muscle Sarcoplasm	Strasburg, G.
Project 1623	Comparative Aspects of Nutrition and Lipid Metabolism	Romsos, D.
Project 1632	Improving the Quality and Safety of Value-Added Meat and Poultry Products	Smith, D.
Project 1649*	Behavioral and Health Factors that Influence the Food Consumption of Young Adults	Hoerr, S.
Project 1664	Manufacturing and Quality of Reduced-Fat and Reduced-Cholesterol Dairy Foods	Ustunol, Z.
Project 1665	Nutritional Status of Individual and Population — Pantothenic Acid Nutriture and Dietary Assessment	Song, W.
Project 1694*	Nutrient Bioavailability — A Key to Human Nutrition	Chenoweth, W.
Project 1699	Molecular Structure of Soft Wheat Proteins in Relation to End-Use Quality	Ng, P.
Project 1715*	Improve Food Safety Through Discovery and Control of Natural and Induced Toxicants and Antitoxicants	Helferich, W.
Project 1723	Assessment of Processes, Formulations and Packaging to Improve Quality and Safety of Dairy Foods	Partridge, J.
Project 1724	Functionality of Ingredients in Baked Products and Food Safety Issues for Michigan Consumers	Zabik, M.
Project 3221	Processing & Quality Evaluation of Fruits & Vegetables	Cash, J.
Project 3276	Food Industry Institute	Haines, W.
Project 3298	Relationship of Diet and Cancer	Bennink, M.
Project 3345	Targeting Michigan Groups at Nutritional/Health Risk	Bond, J.
Project 3348	Food Intake Patterns as Indicators of Diet Quality and Weight Status	Hoerr, S.
Project 6866	Cardiac Ca²⁺ Channel Defect in Malignant Hyperthermia	Strasburg, G.
Project 8089	Metabolism and Function of Retinoic Acid in Quail Embryogenesis	Zile, M.
Project 8122	ELISA Verification of End-Point Processing Temperatures in Roast Beef	Smith, D.

Forestry

Project 978	Financial Evaluation of Forest Management Opportunities	Potter, K.
Project 1048	The Hygroscopic Dimensional Changes of Wood and Wood Products	Suchsland, O.
Project 1148	Development of Techniques in Forest Biometry	Ramm, C.
Project 1198	Biology of Terpenes in Woody Plants	Keathley, D.
Project 1207	Silviculture and Physiology of Michigan Tree Species Grown Under Intensive Management	Dickmann, D.
Project 1432	Attitudes Toward Natural Resources and the Environment in the 1990s: A Representative Approach	McDonough, M.
Project 1438	Enhancing Amenity Values of Urban and Rural Trees	Kielbaso, J.
Project 1494	Intensive Management for the Regeneration of Conifers and Hardwoods in Michigan	Lantagne, D.
Project 1535	Forest Resources Planning	Leefers, L.
Project 1551	Ecological Factors Affecting Tree Productivity	Pregitzer, K.
Project 1693*	The National Atmospheric Deposition Program — A Long-Term Monitoring Program in Support of Research on Effects of Atmospheric Chemical Deposition	Hart, J.
Project 3157	Accelerating Tree Growth by Manipulating Genetic and Cultural Factors	Keathley, D.

Forestry

(continued)

Project 3331	Soil and Hydrology Relationships of Forested Landscape Ecosystems	Hart, J.
Project 7565	Advanced Technology Applications to Eastern Hardwood Utilization	Keathley, D.
Project 7571	Advanced Technology Applications of Eastern Hardwood Utilization	Suchsland, O.
Project 7573	Advanced Technology Applications to Eastern Hardwood Utilization	Keathley, D.
Project 7582	Advanced Technology Applications to Eastern Hardwood Utilization	Suchsland, O.
Project 7597	Advanced Technology Applications to Eastern Hardwood Utilization	Suchsland, O.

Horticulture

Project 935	Effects of Biologically Active Chemicals on Plant Growth and Development	Bukovac, M.
Project 1153*	Quality Maintenance and Nutritive Aspects of Vegetables During Processing and Storage	Herner, R.
Project 1155*	Postharvest Physiology of Fruits	Dilley, D.
Project 1222*	Introduction, Multiplication, Evaluation, Preservation, Documentation, Enhancement, Distribution and Utilization of Plant Germ Plasm	Iezzoni, A.
Project 1272	Physiology of Carbon Balance in Horticulture Crops	Flore, J.
Project 1305*	Rootstock and Interstem Effects on Pome and Stone Fruit Trees	Perry, R.
Project 1325	Sustainable Weed Control and Crop Nutrition on Organic Soil Vegetables	Zandstra, B.
Project 1428	Sour Cherry and Peach Breeding and Genetics	Iezzoni, A.
Project 1461*	Freeze Damage and Protection of Fruit and Nut Crops	Howell, G.
Project 1468	Mineral Nutrition of Vegetable Crops	Widders, I.
Project 1517	Optimization of the Root Zone Environment in Greenhouse Crop Production	Biernbaum, J.
Project 1544	Manipulation and Transfer of Nuclear and Organelle Genes in Vegetable Cultivars by Cell Fusion	Sink, K.
Project 1549	Application of Molecular Genetic Approaches to Vegetable Crop Improvement	Grumet, R.
Project 1589	Environmental and Physiological Variables Effect on Growth, Quality and Marketability of Garden Crops	Carlson, W.
Project 1607	Physiological Adaptation and Cultural Manipulation of Woody Plant Systems	Schutzki, R.
Project 1636	Quality Maintenance of Horticultural Crops During Handling and Storage	Herner, R.
Project 1637	Postharvest Physiology of Fruits	Dilley, D.
Project 1638	Rootstock, Root System and Soil Effects on Fruit Crops Growth and Fruiting	Perry, R.
Project 1680	Biologically Active Natural Products and Value Added Products from Crops	Nair, M.
Project 1684	Modified Atmosphere Packaging of Horticultural Produce	Cameron, A.
Project 1697*	Controlled Environment and Facilities Engineering for Greenhouses	Heins, R.
Project 3012	Chemical Regulation of Plant Growth, Quality and Yield	Ries, S.
Project 3218	Manage Viticulture to Maximize Yield/Fruit/Process Quality and Adaptation to Environmental Stress	Howell, G.
Project 3247	Breeding and Selection of New Grape Cultivars for Michigan	Hancock, J.
Project 3266	Breeding and Genetics of Onions	Ewart, L.
Project 3272	Physiological and Environmental Factors Influencing Growth and Development of Flower Crops	Heins, R.
Project 3281	Efficient Use of Fertilizer in Fruit Production	Hanson, E.

Horticulture

(continued)

Project 3305	Viticultural Practices for Mechanical Pruning and Crop Control of Concord and Niagara Grapevines	Zabadal, T.
Project 3308	Physiological and Genetic Factors Influencing the Content and Bioavailability of Nutrients in Vegetable Crops	Kelly, J.
Project 3309	Controlling Flowering, Fruit Set and Fruit Size in Tree Fruits	Dennis, F.
Project 3310	Preserving Postharvest Quality of Fruits and Vegetables	Beaudry, R.
Project 3311	Development of Tree Fruit Cultural Practices to Improve Fruit Quality and Productivity	Hull, J.
Project 3323	Genetic Improvement of Strawberries and Blueberries	Hancock, J.
Project 7583	Factors Causing Decline of Stone Fruit Trees with Emphasis on Sweet Cherry under Michigan Conditions	Flore, J.
Project 7585	Apple Quality Improvement Through Production, Storage and Distribution Technology	Dilley, D.
Project 7589	Environmental Impact of Transgenic Plants Via Pollen Exchange	Grumet, R.
Project 8097	Inhibition of Flowering in Apple: Role of Gibberellin Metabolism	Dennis, F.
Project 8109	Developing Genetic Markers for Breeding and Biotechnology of Asparagus	Sink, K.

Human Ecology

Project 3306	Vulnerable Children, Tools for Communities to Monitor Conditions Affecting Youth Development	Keith, J.
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Human Environment & Design

Project 1442*	Enhancing Health and Safety Through Personal Protective Equipment	Slocum, A.
Project 1565*	Rural Retailing: Impact of Change on Consumer and Community	Sternquist, B.
Project 3286	Residential Architecture in 19th Century Michigan	Graham, R.
Project 3326	Proximity of Clothing to Self: Scale, Construction, Measurement and Theory Development	Sontag, M.
Project 3328	China: The Distribution of Food and Agricultural Products	Sternquist, B.

Kellogg Biological Station

Project 8101	Spatial Patterning of N Transformations in Agricultural Ecosystems	Paustian, K.
Project 8108	Speciation of Solution Nitrogen Losses from Agricultural and Forested Landscapes	Hedin, L.

Large Animal Clinical Sciences

Project 1417*	Bovine Respiratory Disease: Risk Factors, Pathogens, Diagnosis and Management	Baker, J.
Project 1550	Bovine Respiratory Disease: Risk Factors, Immunology, Pathogenesis and Control	Baker, J.
Project 1674	Airway Disease in the Horse	Robinson, N.
Project 6805	Bovine Leukemia in Michigan Dairy Cattle	Kaneene, J.
Project 6855	Infectious Causes of Diarrhea Among Neonatal Farm Animals	Holland, R.
Project 6856	The Influence of Choline Deficiency on the Development of Ketosis and Fatty Liver in Dairy Cows	Herdt, T.
Project 6857	Epidemiological Study of Food Safety Concerns of <i>E. coli</i> 0157:h7	Kaneene, J.
Project 6862	The Effect of Use of a Platelet-Activating Factor Antagonist (WEB 2086) in Equine Large Colon Torsion	Wilson, D.
Project 6865	Transvaginal/Transuterine Aspiration of Chorioallantoic Fluid from Early Bovine Pregnancies	Sprecher, D.
Project 6869	Evaluation of Dairy Reproductive Health Indicators	Lloyd, J.
Project 6873	Cost-Benefit Comparison of Prevention and Therapy for Production Diseases of Dairy Cattle	Bartlett, P.
Project 6875	Neuropeptides Influences on Cartilage and Synovial Metabolism	Caron, J.
Project 7561	Information Management, Systems Modeling and Computer Simulation for Health Management in Hogs	Lloyd, J.
Project 7581	Minor Use Animal Drug Program — North Central Region	Holland, R.
Project 8116	Plasma Cholesterol and Corpus Luteum Function in Cows	Herdt, T.

Microbiology

Project 1314	Symbiotic Infection of Legume Roots by Nitrogen-Fixing Rhizobium	Dazzo, F.
Project 1371	An <i>In Vivo</i> Model to Study Latent Pseudorabies Virus Infections	Maes, R.
Project 1453	Structure/Function Relationships in Chicken Globin and Histone Genes	Dodgson, J.
Project 1481	Characterization and Inhibition of Bacterial Urease	Hausinger, R.
Project 1557	Molecular Regulation of Streptomyces Antibiotic Synthesis	Champness, W.
Project 1593*	Advanced Technologies for the Genetic Improvement of Poultry	Dodgson, J.
Project 1628	Identification and Analysis of the Genes of Marek's Disease Herpesvirus and the Proteins They Encode	Velicer, L.
Project 1629	Lignin Degradation by Wood-Rotting Fungi	Reddy, C.
Project 1681	Molecular Basis of Symbiotic Plant-Microbe Interactions	de Bruijn, F.
Project 1689	Degradation of Lignocellulose by Termites and Their Microbial Symbionts	Breznak, J.
Project 3116	Bacterial Ecology: Diverse Energy Reactions and Regulation in Bacteria	Uffen, R.
Project 3120	Microbial Decomposition of Organic Matter in Aquatic Systems	Klug, M.
Project 6858	PCR-Based Evaluation of the Influence of Vaccination on Pseudorabies Virus Latency	Maes, R.
Project 6861	Nucleotide Sequence Analysis of cDNA Encoding the Matrix-Like Protein May Elicit CMI Against BRSV	Velicer, L.
Project 6874	Epitope Display Vector for Construction of Multivalent Vaccines	Bagdasarian, M.
Project 7559	Polymerase Chain Reaction Based Detection of Pseudorabies Virus Latency	Maes, R.
Project 8078	Marek's Disease Herpesvirus: Membrane Glycoprotein Gene Analysis, a gD Homolog	Velicer, L.

Microbiology

(continued)

Project 8096	Characterization and Inhibition of Bacterial Urease	Hausinger, R.
Project 8103	Antisense RNA Genes to Inhibit the Replication of Avian Leukosis Virus	Salter, D.
Project 8113	NOD-Dependent Root Hair Deforming and Nodule Initiating Factors from <i>Rhizobium</i>	Dazzo, F.
Project 8117	Structural and Functional Domains of <i>E. coli</i> Enterotoxin	Bagdasarian, M.
Project 9002	Poultry Genome Mapping Coordinator	Crittenden, L.

Packaging

Project 1520	Transport Properties of Polymer Films as Related to the Quality and Storage Stability of Packaged Products	Giacin, J.
Project 1672	Consumer Size Modified Atmosphere Packaging of Fresh Produce	Lee, J.
Project 3321	Improving the Quality of Products and Distribution Productivity Through Packaging Innovation	Twede, D.
Project 3322	Mass Interactions in Solid Polymer/Fluid Phase Systems and Their Relation to Product Quality	Hernandez, R.

Park & Recreation Resources

Project 1667	Factors Affecting Timber Management on Michigan Hunting Clubs and Leased Lands	Nelson, C.
Project 1677	Predicting Recreation and Tourism Choices	Stynes, D.
Project 1678	Impacts of Recreation and Tourism	Stynes, D.
Project 3280	Travel, Tourism and Recreation Resource Center	Holecek, D.
Project 3343	Psychology of Recreation and Tourism	Fridgen, J.
Project 9000	Development and Implementation of Economic Impact Models	Stynes, D.

Pathology

Project 1154*	Prevention and Control of Enteric Diseases of Swine	Grimes, S.
Project 1634	Hematopathology of Line-Bred Livestock	Bell, T.
Project 1647	Ocular and Otic Pathology of Animals	Render, J.
Project 1651	Genetic Disorders of Livestock	Padgett, G.
Project 1658	Prevention and Control of Enteric Diseases of Domestic Animals	Grimes, S.
Project 1720	Immunohistochemical Diagnosis of Infectious Diseases	Patterson, J.
Project 6863	B-Mannosidosis Carrier Detection in Salers Cattle Using RFLP Analysis	Patterson, J.

Pesticide Research Center

Project 1730*	A National Agricultural Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
Project 3220	Exploratory Research in Pesticide Toxicology	Hollingworth, R.
Project 3330	Environmental Dynamics of Xenobiotics in the Environment and Analytical Methods Development	Zabik, M.
Project 7541	NC Regional IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
Project 7575	Assessment of Episodic Atmospheric Events that Regulate Movement of Economically Important Migratory Pests	Whalon, M.
Project 7577	Minor Use Drug Program — Headquarters	Hollingworth, R.
Project 7578	NC Region IR-4 Leader Lab Program to Clear Pest Control Agents For Minor Uses	Hollingworth, R.
Project 7584	Michigan NAPIAP Project 1993	Olsen, L.

Physiology

Project 1542	Signal Transduction in the Pancreatic Duct System	Hootman, S.
Project 1554	Carbohydrate Recognition During the Development of the Nervous System	Zipser, B.

Plant Research Lab, MSU-DOE

Project 7592	Antifungal and Insect Antinutrient Activities of Chitin-Binding Proteins in Transgenic Plants	Raikhel, N.
Project 7593	Expression of Insecticidal Protein Genes in Maize and Tobacco: Control of Transcript Abundance	Green, P.
Project 8077	Control of mRNA Stability in Dicotyledonous Plants	Green, P.
Project 8081	Molecular Basis and Manipulation of Stress-Induced Betaine Synthesis in Plants	McIntosh, L.
Project 8082	CIS and Transacting Elements/Factors in Nodulin Gene Regulation	de Bruijn, F.
Project 8090	Role of Cell Wall Degrading Enzymes in Plant Pathogenesis	Walton, J.
Project 8095	Photoperiodic Control of Gibberellin Metabolism in Long-Day Plants	Zeevaart, J.
Project 8098	Genetic Alteration of Respiratory Capacity in Crop Plants	McIntosh, L.
Project 8100	Genetic Analysis of Plant Cell Wall Structure and Function	Somerville, C.
Project 8111	Targeting to the Nucleus in Plant Cell	Raikhel, N.
Project 8119	Rhizopine Synthesis and Catabolism Genes for the Creation of "Biased Rhizospheres"	de Bruijn, F.
Project 8121	CIS-Acting Elements and Transacting Factors Involved in Nodulin Gene Regulation	de Bruijn, F.

Project 3312	Agricultural and Natural Resource Management: Applications of Advanced Information Processing Technologies	Bartholic, J.
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**Remote
Sensing,
Center for**

Project 1102	Public Policy Regarding Health and Environmental Risks: Assessment, Management and Public Participation	Bronstein, D.
Project 1515*	Policy Implications for Farm Household and Rural Community Responses to Economic Changes	Vlasin, R.
Project 1536	Systems Approaches to Resource Assessment, Planning and Management for Rural Development	Schultink, G.
Project 3235	Mineral Lands Development, Energy Requirements and Environmental Impacts	Kakela, P.
Project 3267	Design and Management Alternatives for Sustainable Agriculture and Natural Resource Systems	Edens, T.
Project 3297	A Strategic Environmental Management System for Michigan's Inland Water Resources	Bartholic, J.
Project 3318	Water Resource Protection at the Interface of the Hydrologic Cycle and Cultural Influences	Dersch, E.
Project 3332	Michigan Farming Systems	Axinn, G.
Project 3803	Cooperative Action Among Michigan Communities to Achieve Economic Advancement	Vlasin, R.

**Resource
Development**

Project 6870	Adema Disease and Mechanism of Zinc Absorption in Cattle	Yuzbasiyan-Gurkan, V.
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**Small Animal
Clinical
Sciences**

Project 1612	Strategic Analysis of Technical Change in Commodity Subsectors	Busch, L.
Project 1620*	The Transformation of Agriculture: Resources, Technologies and Policies	Harris, C.
Project 1641*	The Changing Structure of Local Labor Markets in Nonmetropolitan Areas	Bokemeier, J.
Project 1642*	Organization and Structural Changes in the Dairy Industry	Schwarzweiler, H.
Project 3337	Work and Family Issues in Rural Michigan Labor Markets	Bokemeier, J.
Project 3339	Migration, Work Careers and Rural Development in Michigan's Upper Peninsula	Schwarzweiler, H.
Project 3350	Mortality of Michigan Residents: Degree of Rurality and Underlying Cause of Death	Johnson, N.

Sociology

List of MAES Contributors

July 1, 1992
to June 30, 1993



<u>Abbott Laboratories</u>	<u>Black & Veatch</u>
<u>AC Rochester</u>	<u>Blossomland Bee Supply</u>
<u>AGDIA, Inc.</u>	<u>Bordine, Bruce & Sharon</u>
<u>Agency for International Development</u>	<u>Government of Botswana</u>
<u>Agri-Business Consultants, Inc.</u>	<u>Brady Farms, Inc.</u>
<u>Agri Technologies, Inc.</u>	<u>Butterworth Hospital</u>
<u>AgriDyne Technologies, Inc.</u>	<u>Bzenko, Alex</u>
<u>Agrolinz, Inc.</u>	<u>Campbell Soup Company</u>
<u>Agtrol Chemical Products</u>	<u>Cargill Hybrid Seeds</u>
<u>Allen & Baer Associates, Inc.</u>	<u>Central Maryland Beekeepers Association</u>
<u>American Angus Association</u>	<u>Central Produce Sales</u>
<u>American Association of Cereal Chemists</u>	<u>Central Soya</u>
<u>American Colloid Company</u>	<u>Chelsea Milling Company</u>
<u>American Cyanamid</u>	<u>Cherry Marketing Institute</u>
<u>American Floral Endowment</u>	<u>Chevron Oil Field Research Company</u>
<u>American Forestry Association</u>	<u>Ciba-Geigy Corp.</u>
<u>Ameri-Can Pedigreed Seed Company</u>	<u>CIMMYT</u>
<u>Amway Corp.</u>	<u>Clackamas Greenhouses</u>
<u>The Andersons</u>	<u>Cline, Jake W.</u>
<u>Asgrow Seed Company</u>	<u>The Clorox Company</u>
<u>Association of American Railroads</u>	<u>Cole Grower Service</u>
<u>Babbitt, David W.</u>	<u>Colorado State University</u>
<u>Ball Flora Plant</u>	<u>Comstock Michigan Fruit</u>
<u>Ball Research</u>	<u>Conlan, Steve (Maple Creek Country Club)</u>
<u>Ball Seed</u>	<u>Conor Apiaries</u>
<u>Baltimore Zoo</u>	<u>Conrad Fafard, Inc.</u>
<u>BASF Corp.</u>	<u>Consortium for International Earth Science Information Network (CIESIN)</u>
<u>Bay Area Community Foundation</u>	<u>Consumers Power Company</u>
<u>Bay Port Aquaculture Systems, Inc.</u>	<u>Cornerstone Ostrich Ranch Estate</u>
<u>Bedding Plant Foundation</u>	<u>The Cotton Foundation</u>
<u>Beekeeper Donors</u>	<u>Crimmins, Roger</u>
<u>Beemer, Myrna</u>	<u>Crystal Enterprises, Inc.</u>
<u>BEI, Inc.</u>	<u>Cuproquim Corporation</u>
<u>Berrien County Farm Bureau</u>	<u>Dadant & Sons, Inc.</u>
<u>Bil-Mar Foods</u>	<u>Development Alternatives, Inc.</u>
<u>Biosys</u>	<u>Dow Corning Corporation</u>
<u>BIO-XL Environmental Corp.</u>	<u>DowElanco</u>

The Dow Gardens	Harbor Springs Area Sewage Disposal Authority
Dow U.S.A.	Harris Moran Seed Company
A. Duda & Sons, Inc.	Health Science Research Foundation
DuPont Agricultural Products	Heinz U.S.A.
Durbin, Carl	Helena Chemical Company
Duwayne's Greenhouses	Herbruck Poultry Ranch
Earthgro, Inc.	Herman, Joseph
Eastman Kodak Company	Hershey Foods Corp.
Paul Ecke Poinsettias	Hobson, Jack
ECOGEN, Inc.	Hoechst-Roussel Agri-Vet Company
Elf Atochem North America, Inc.	Hoffmann-La Roche, Inc.
Eli Lilly and Company	Howard University
Emerick, Brent (Indiana University Golf Course)	Huggett Sod Farm, Inc.
Entotech, Inc.	Huron Mountain Wildlife Foundation
Evenflo Products Company	HybridTech Seed International
Falg Nurseries Pty., Ltd.	ICAR National Dairy Herd Improvement Association
Federal Express	ICI Americas, Inc.
Fermone Corporation, Inc.	IIT Research Institute
Fernlea Flowers	Inland Container Corp.
Floratine Products Group, Inc.	Iowa State University
FMC Corp. — Agricultural Chemical Group	IRAC
Food and Drug Administration	ISK-Biotech Corp.
Ford Motor Company	Israelite House of David
Foundation for Agronomic Research	Kalamazoo Valley Plant Growers Coop
Four Star Greenhouse	Kaltec Scientific, Inc.
Franco-Vizcaino, Ernesto	Kellogg Company
Frankenmuth Poultry Company	Kentucky Fried Chicken
Franklin, Pat (River Glen Golf Course)	Kevern, Dr. Niles
Friday, Paul J.	King Milling Company
General Foods USA	Kirin Brewery
General Mills, Inc.	Kleinheksel, Robert
Gerber Products Company	Knappen Milling Co.
Rollin M. Gerstacker Foundation	Krieger, Robert
Glass Corner Greenhouses	Kunnath, William
GLEI's, Inc.	Lansing Grain Company
Fred C. Gloeckner Foundation	Lansmont Corp.
W.R. Grace & Company	LASPAU
Grace Sierra Horticultural Products	Legislative Service Bureau
Grant Farms	LESCO, Inc.
Grass Lake Hunting & Fishing Club	Lipan Kickapoo Water Conservation District
Great Lakes Hybrids	Lombard, R.S.
Great Lakes Protection Fund	Long, Robert J.
Green Bay Food Company	Loveland Industries, Inc.
Griffin Corp.	Martin Marietta
Growmark, Inc.	Henry Mast Greenhouses
Phoebe W. Haas Charitable Trust	Neal Mast & Sons Greenhouses
Hannar, Alice	McCardell, Allen E. (Engineering Consultants)

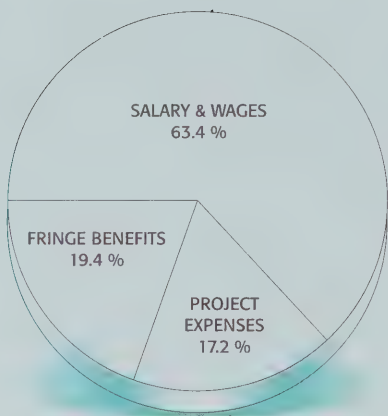
McGlauchlin, Frank	Miles, Inc.
Meiring Greenhouse & Farm	Mississippi Valley State University
Mennonite Central Committee	M&M Mars
Merck & Company, Inc.	Molbak's Greenhouse, Inc.
Merrell Dow Pharmaceuticals	Monitor Sugar Company
Metamora Elevator Company	Monsanto Agricultural Company
Metro Detroit Flower Growers Association	Kay Mukai Research Foundation
MFS/York	Murco, Inc.
Micandy Garden Greenhouses	Mycogen Corp.
Michigan Agri-Business Association	National Dairy Promotion & Research Board
Michigan Apple Research Committee	National Grape Cooperative Association, Inc.
Michigan Asparagus Research Committee	National Institute of Drug Abuse
Michigan Bean Commission	National Institutes of Health
Michigan Biotechnology Institute	National Outdoor Leadership School
Michigan Blueberry Growers Association (MBG Mktg)	National Pork Producers Council
Michigan Carrot Committee	National Science Foundation
Michigan Celery Growers Research Council	National Turfgrass Federation
Michigan Christmas Tree Association	Nefab, Inc.
Michigan Crop Improvement Association	Neogen Corp.
Michigan Department of Agriculture	Nettleman, William E.
Michigan Grape & Wine Industry	New Center Area Council
Michigan Department of Commerce, Travel Bureau	Newark Nurseries, Inc.
Michigan Department of Education	NIEHS
Michigan Department of Energy	Noble, Lachlan W., D.D.S.
Michigan Department of Management & Budget	O.J. Noer Foundation
Michigan Department of Natural Resources, Forest Management Division, Michigan Great Lakes Protection Fund and Wildlife Division	Nor-Am Chemical Company
Michigan Department of Public Health	North American Blueberry Council
Michigan Foundation Seed Association	North American Strawberry Growers
Michigan Mint Research Council & Development Program	Oregon State University
Michigan Nursery & Landscape Association	Owens-Illinois
Michigan Onion Committee	Ed Oxley Farms
Michigan Peach Sponsors	Parker, H. Jean
Michigan Pear Research Association	Parrish & Heimbecker, Inc.
Michigan Plum Advisory Board	Paul, E.A.
Michigan Potato Industry Commission	Pettengill, Donald & Delores
Michigan Sea Grant College Program	Pheasants Forever, Inc.
Michigan State Horticulture Society	Pickle Packers International, Inc.
Michigan State Miller's Association	The Pillsbury Company
Michigan Sugar Company	Pioneer Hi-Bred International, Inc.
Michigan Turfgrass Foundation	Plantco, Inc.
Michigan Vegetable Council, Inc.	Post Gardens of Battle Creek
Mid-America Food Processors	Potash & Phosphate Institute
Midwest Plant Biotechnology Consortium, Purdue University	Premier Peat Moss, Ltd.
	Professional Plant Growers Association
	Pugh, Homer R.
	Pugsley Farm/Frederick M. Pugsley
	Purdue University
	Quaker Oats Company

C. Raker & Sons, Inc.
 Regents of the University of Minnesota
 Resource Seeds, Inc.
 Rhone-Poulenc Ag Company
 Ringer
 Rockefeller Foundation
 The Rocky Mountain Elk Foundation
 Rogers NK
 Rohm & Haas Company
 Rutgers University
 Saginaw County Extension Office
 Saginaw County Mosquito Abatement
 Commission
 St. Julian Wine Company, Inc.
 Sanders, Fritz
 Sandoz Agro, Inc.
 Saudi Arabian Education Mission
 Scheidler GMBH & Company, KG
 Schemenauer, Luka G.
 J. Frank Schmidt Family Charitable Trust
 Schmitt, Joseph
 Schroeder, Aubrey L.
 The Scotts Company
 Select Sires
 Sharp, John W.
 Smithsonian Institution
 Snapper Corp.
 Snobelt Greenhouses
 Snyder, Charles E., Jr. & F Genese
 Sonnsyde Flowers
 Southeastern Michigan Beekeepers
 Association
 Southeastern Michigan Christmas Tree
 Association
 Southwest Michigan Beekeepers Association
 Southwest Missouri State University
 Star of the West Milling Company
 Swift Greenhouses
 Tanton, John H.
 Tapper Pest Management
 Tatter, Jordan B. & Mary E.
 Tektronix, Inc.
 Tennessee Valley Authority
 Terra International, Inc.
 Thompson Lambert Corp.
 Thompson, W.G. & Sons, Ltd.
 Timbuk Farms, Inc.
 The Toro Company
 Traverse Fruit Wood Company
 Tredegar Film Products

Uniroyal Chemical Company
 United Agri Products
 United Films Corp.
 U.S. Agency for International Development
 U.S. Air Force
 U.S. Department of Agriculture
 U.S.D.A. Agricultural Research Service
 U.S.D.A. Cooperative State Research Service
 U.S.D.A. Economic Research Service
 U.S.D.A. Extension Service
 U.S.D.A. Forest Service
 U.S.D.A. Soil Conservation Service
 U.S. Department of Energy
 U.S. Department of Interior
 U.S.D.I. Fish & Wildlife Service
 U.S.D.I. Geological Survey
 U.S. Environmental Protection Agency
 U.S. Golf Association
 University of California
 University of Michigan
 University of Nebraska
 University of Wyoming
 The Upjohn Company
 U.P. White Tails Associates
 Valent
 Vaughan's Seed Company
 Vigoro Industries, Inc.
 Virginia Polytechnic Institute & State
 University
 Wang, Simon
 Washington Tree Fruit
 Webb Wright Corp.
 Western Michigan Bedding Plant Association
 Westvaco
 Wilbur-Ellis Company
 Wildlife Unlimited
 The Wilkie Company, Inc., Turf Equipment
 Division
 Winrock International
 State of Wisconsin
 Yamazaki Baking Company, Ltd.
 Yarger, Richard
 Zelenka Nursery, Inc.
 Zeneca Ag Products, Inc.
 Ziegelman Foundation
 Government of Zimbabwe
 Zoological Society of Milwaukee County

Financial Report

July 1, 1992
to June 30, 1993



DISTRIBUTION OF APPROPRIATED FUNDS

INCOME:

\$54,394,581

Federal Appropriations	\$4,811,123
Hatch	\$3,725,688
McIntire-Stennis	\$167,859
Hatch RRF	\$840,903
Hatch Animal Disease Research	\$76,673
State Appropriations	\$23,480,580
TOTAL APPROPRIATIONS:	\$28,291,703
Grants — Federal, State and Private	\$26,102,878

EXPENSES:

\$54,394,581

Salaries	\$17,926,474
Fringe Benefits	\$5,484,436
Project Expenses	\$4,880,793
Grants — Federal, State and Private	\$26,102,878

Personnel

(Full-time Equivalents)

Research Staff*	150.79
Professors	83.58
Associate Professors	25.89
Assistant Professors	24.67
Research Associates and Specialists	16.65
Support Staff	160.57
Administrative Professionals	76.86
Supervisors	23.45
Clerical	52.50
Technicians	7.76

*Does not include department chairpersons/unit administrators

Michigan Agricultural Experiment Station
Robert G. Gast, Director
Michigan State University
East Lansing, Michigan 48824-1039

SR-66, January 1994

The Michigan State University Agricultural Experiment Station is an equal opportunity employer and complies with Title VI of the Civil Rights Act of 1964 and Title XI of the Education Amendments of 1972.

